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DOE STANDARD

WASTE MANAGEMENT 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.

Roy J. Schepens
Chairman
Federal Technical Capability Panel

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ACKNOWLEDGMENT

The Office of Environmental Management is the Sponsor for the Waste Management 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 Waste Management 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 (SMEs) participated in the development and/or review of this Qualification Standard:

Joe Arango	Office of Environmental Management (EM-3) (Team Leader)
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U.S. DEPARTMENT OF ENERGY
FUNCTIONAL AREA QUALIFICATION STANDARD

FUNCTIONAL AREA

Waste Management

PURPOSE

The Department's Federal Technical Capability Program Policy, issued by the Secretary in December 1998, commits the Department to continuously strive for technical excellence. The Technical Qualification Program, 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. 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 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 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 Waste Management Functional Area Qualification Standard establishes common functional area competency requirements for Department of Energy personnel who provide assistance, direction, guidance, oversight, or evaluation of contractor technical activities impacting the safe operation of DOE's most hazardous 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 are expected to use this technical Functional Area Qualification Standard as-is, and they may add to it with their own unique site or facility specific Technical Qualification Standards. Supervisors may also establish expectation levels for their employees in cases where they wish to have someone more expert in specific waste management areas (such as LLW) while maintaining familiarity levels in other areas (such as TRU and HLW). In either case, satisfactory and documented attainment of the competency requirements contained in this technical Functional Area Qualification Standard ensures that personnel possess the requisite competence to fulfill their functional area duties and responsibilities. Office/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

This technical Functional Area Qualification Standard identifies the technical competency requirements for Department of Energy personnel. Although there are other competency requirements associated with the positions held by DOE 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 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 DOE 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 who 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.

EVALUATION REQUIREMENTS

Attainment of the competencies listed in this technical Functional Area Qualification Standard should be documented by a qualifying official, immediate supervisor, or the team leader of personnel using any of the following methods:

- Documented evaluation of equivalencies
- Written examination
- Documented oral evaluation
- Documented observation of performance

CONTINUING EDUCATION, TRAINING AND PROFICIENCY

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:

- 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 waste management personnel 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 Waste Management Functional Area:

1. Develops, implements, and evaluates waste management strategic, baseline, project, and program plans.

2. Maintains communication with Headquarters, field elements, regulatory agencies, the public and other stakeholders.

3. Develops, reviews and implements waste management policy, requirements and guidance.

4. Oversees waste management programs to determine whether the program complies with applicable codes, standards and guides, regulations, Orders and accepted practices.

5. Appraises facilities, procedures, and operations to determine their adequacy to protect the environment, the workers and members of the general public.

6. Administers and coordinates waste management programs for the Department, including performing independent evaluations and special studies.

7. Provides technical assistance and advice in the area of waste management to other organizations and independent review groups.

8. Reviews Office and/or contractor performance to identify trends indicative of performance or compliance status.

9. Performs technical reviews and provides recommendations on Waste Management Program documents (plans, schedules, etc).

10. Reviews and comments on a wide variety of operating contractor documents such as authorization basis documents, Disposal Authorization Statements, and Performance Assessments.

11. Evaluates, oversees, and provides emergency preparedness and emergency response support related to waste management incidents in conjunction with contractor, Federal, State and local officials, as required.

Position-specific duties and responsibilities for waste management personnel are contained in their Office/Facility-Specific Qualification Standard or Position Description.

BACKGROUND AND EXPERIENCE

The U.S. Office of Personnel Management'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 waste management personnel is:

a. Education:

   Bachelor of Science degree in engineering or physical science from an accredited institution or meet the alternative requirements specified in the Qualification Standards Handbook for the GS-1300, Physical Scientist and Health Physics Series; GS-800, General Engineer series; and the GS-400, Biological Sciences series.

b. Experience:

   Industry, facility, operations, other Federal related experience that has demonstrated background in waste, environmental or project management.

REQUIRED TECHNICAL COMPETENCIES

The competencies contained in this Standard are distinct from those competencies contained in the General Technical Base Qualification Standard. All Waste Management personnel 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 define the level of expected knowledge and or skill that an individual must posses to meet the intent of this Standard. The supporting knowledge and/or skill statements further describe the intent of the competency statements.

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.

SCIENTIFIC AND ENGINEERING PRINCIPLES

Chemistry

1. Waste management personnel shall demonstrate a familiarity level knowledge of chemistry fundamentals.

Supporting Knowledge and/or Skills

a. Discuss the following types of chemical bonds:

- Ionic
- Covalent
- Metallic

b. Discuss how elements combine to form chemical compounds.

c. Define and discuss the following terms:

- Mixture
- Solvent
- Solubility
- Solute
- Solution
- Equilibrium
- Density
- Molarity
- Parts per million (ppm)
- Acid
- Base
- pOH
- Salt
- pH

2. Waste management personnel shall demonstrate a familiarity level knowledge of chemistry fundamentals in the areas of corrosion and water treatment.

Supporting Knowledge and/or Skills

a. Explain the process of general corrosion of iron and steel when exposed to water.
b. Discuss the two conditions that can cause galvanic corrosion.

c. Discuss the following types of specialized corrosion:

- Pitting corrosion
- Stress corrosion cracking
- Crevice corrosion

d. Explain the following water treatment processes.

- Ion exchange
- pH adjustment
- Clarification
- Solids handling
- Disinfection techniques
- Enhanced evaporation
- Reverse osmosis
- Electrodialysis
- Carbon adsorption
- Precipitation
- Flocculation

Statistics

3. Waste management personnel shall demonstrate a familiarity level knowledge of probability and simple statistics.

Supporting Knowledge and/or Skills

a. State the definition of the following statistical terms:

- Mean
- Variance
- Standard deviation of the mean
- Median
- Mode
- Standard deviation

b. Explain the structure and function of distributions.

c. Calculate the mathematical mean of a given set of data.

d. Calculate the mathematical standard deviation of the mean of a given set of data.

e. Given the data, calculate the probability of an event.

f. Describe how measures of samples (i.e., measures of central tendency and variability) are used to estimate population parameters through statistical inference.

g. Discuss Type I and Type II decision errors and the relationship to sampling and confidence levels.

Hydrology, Geology, and Soil Science

4. Waste management personnel shall demonstrate a familiarity level knowledge of the basic principles and concepts of hydrology, geology, and soil science.

Supporting Knowledge and/or Skills

a. List the different soil textures (compositions) and soil structures.

b. Define humus and explain its role in chemical reactions in the soil.

c. Define erosion and describe the characteristics and effects of water and wind erosion.

d. Describe the following processes and explain how water and soil interact in each:

- Infiltration and percolation
- Groundwater recharge
- Runoff
- Evapotranspiration

e. Describe how soil characteristics, slope factors, and land cover conditions impact contaminant detachment and transport processes.

f. Discuss contaminant loading and the contaminant delivery ratio.

g. Discuss the use of soil survey maps.

h. Describe the geometry and properties of the following rock mass features:

- Folds
- Faults
- Structural Discontinuities
- Residual Stress
- Sheet Joints
- Structural discontinuities
- Shear strength of discontinuities
- Residual stress
- Sheet joints

i. Discuss the use of geological and geotechnical maps.

j. Describe the geologic considerations, criteria and procedures used to assess natural hazards and potential environmental problems related to the following topographic features and conditions:

- Areas of high or low relative relief
- Potentially unstable slopes
- Flood plain
- Karst terrain

k. Discuss weathering and its significance in geotechnical engineering.

l. Describe and discuss tests that assess weatherability.

m. Describe and discuss the process for logging rock cores.

Meteorology

5. Waste management personnel shall demonstrate a familiarity level knowledge of the basic principles and concepts of meteorology.

Supporting Knowledge and/or Skills

a. Discuss the properties of high pressure and low pressure systems and their impact on air pollution.

b. Discuss the following horizontal dispersion terms:

- Wind rose
- Pollution rose/plume meander

c. Describe the role of lapse rate in determining dispersion coefficients.

- Dry adiabatic lapse rate
- Prevailing lapse rate
- Neutral lapse rate
- Subadiabatic lapse rate
- Weak lapse rate
- Inversion
- Superadiabatic lapse rate

d. Describe the classes of atmosphere stability, including inversions.

e. Describe the kind of information given by a wind rose and pollution rose.

Environmental Biology

6. Waste management personnel shall demonstrate a familiarity level knowledge of the basic terms and concepts of environmental biology.

Supporting Knowledge and/or Skills

a. Define the following terms:

- Ecosystem
- Habitat
- Species
- Pathways analysis
- Bioaccumulation
- Bioconcentration
- Biotoxicity
- Biodiversity

b. Discuss how synergism makes it difficult to establish a cause and effect relationshipbetween pollutants and disease.

Engineering Drawings

7. Waste management personnel shall demonstrate a working level knowledge of engineering drawings.

Supporting Knowledge and/or Skills

a. Given an engineering drawing, read and interpret the information contained in the title block, the notes and legend, the revision block, and the grid.

b. Identify the symbols used on engineering drawings for:

- Types of valves and actuators
- Basic types of instrumentation
- Types of instrument signal controllers and modifiers
- Types of system components (pumps, etc.)
- Types of lines, piping and vessels
- Types of materials of construction

c. Identify the symbols used on engineering Piping and Instrument Drawings that denote the location of instruments, indicators, and controllers.

d. Identify how valve conditions are depicted.

e. Determine system flowpath(s) for a given valve lineup.

Heat Transfer, Fluid Flow and Thermodynamics

8. Waste management personnel shall demonstrate a familiarity level knowledge of basic heat transfer, fluid flow and thermodynamics concepts and theories.

Supporting Knowledge and/or Skills

a. Define the following terms:

- Specific volume
- Density
- Specific gravity
- Mass
- Weight

b. Describe the relationship between absolute pressure, gauge pressure, and vacuum.

c. Define the following and describe their relationship:

- Energy
- Potential Energy
- Kinetic Energy
- Work
- Heat

d. Describe the following types of thermodynamic systems:

- Isolated system
- Open system
- Closed system

e. Using the ideal gas law discuss the relationship between pressure, temperature, and volume.

f. Describe the effects of pressure and temperature changes on confined fluids.

g. Describe how the density of a fluid varies with temperature.

h. Describe the two types of heat exchanger construction.

i. Describe hot and cold fluid flow in parallel flow, counter flow, and cross flow heat exchangers.

j. Discuss the following heat exchanger applications:

- Evaporator
- Radiator
- Condenser
- Cooling tower

k. Define the term buoyancy.

l. Describe the relationship between the pressure in a fluid column and the density and depth of the fluid.

m. Define the property of viscosity.

n. Define the term head, head loss, and frictional loss, with respect to its use in fluid flow.

o. Define the terms water and steam hammer and describe their physical affects on piping systems.

Problem Analysis

9. Waste management personnel shall demonstrate a working level knowledge of problem analysis principles and techniques necessary to determine potential causes of the problems, and identify corrective actions(s) as identified in DOE O 225.1A.

Supporting Knowledge and/or Skills

g. Describe and explain the application of problem analysis techniques including the following:

- Root Cause Analysis
- Causal Factor Analysis
- Change Analysis
- Barrier Analysis

h. 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

- Recommendation Generation

c. Compare and contrast Type A and Type B accident investigations and discuss an example of the application of each.

d. Explain the necessity for and differences between the immediate, short term, and long term actions taken as the result of a problem identification or occurrence.

e. Explain and apply problem analysis techniques to the identification of potential problems and/or the prevention of problems. Include data gathering techniques and the use of trending/history in your explanation.

i. Participate in a contractor problem analysis and critique the results.

OPERATIONAL KNOWLEDGE

10. Waste management personnel shall demonstrate a familiarity level of knowledge of the training and qualification requirements for defense nuclear facility personnel described in DOE Order 5480.20A.

Supporting Knowledge and/or Skills

e. Discuss the purpose and scope of DOE O 5480.20A.

f. Describe the five elements of a systematic approach to training.

g. Discuss the relationship between training, risk, and safe facility operations.

h. Discuss key elements of an effective on-the-job training program.

i. Identify the types of training records required to be retained as permanent records.

11. Waste management personnel shall demonstrate a familiarity level of knowledge of Conduct of Maintenance (DOE O 433.1) principles and Department of Energy requirements to ensure maintenance is performed in a safe and efficient manner.

Supporting Knowledge and/or Skills

a. Explain the Department of Energy's role in the oversight of contractor maintenance operations.

b. Explain the intent of DOE Order 433.1, "Maintenance Management Program for DOE Nuclear Facilities".

c. Define each of the following maintenance related terms and explain their relationship to each other:

- Corrective
- Preventive
- Periodic
- Planned
- Reliability Centered

d. Explain the purpose and content of a Master Equipment List.

e. Describe the procedure development, verification, and validation process.

f. Explain the purpose of maintaining good facility condition and housekeeping.

g. Conduct a facility observation walk through and identify deficiencies often found with respect to Material, Housekeeping, Industrial Safety, and Radiological areas.

h. Describe configuration control and its relationship to the maintenance work control process and the maintenance history file.

i. Explain facility management's role in facility maintenance.

j. Describe the purpose and scope of the Maintenance Implementation Plan.

k. Identify the types of data and records required to be retained as permanent records.

12. Waste management personnel shall demonstrate a familiarity level knowledge of Department of Energy Technical Standard DOE-STD-1073-93, Guide for Operational Configuration Management Program.

Supporting Knowledge and/or Skills

a. Describe the purpose and objectives of the Operational Configuration Management Program.

b. Discuss what constitutes acceptable contractor compliance consistent with the requirements of DOE-STD-1073-93, Guide for Operational Configuration Management Program, for the following elements of the contractor's Configuration Management Plan:

- Program planning
- Equipment scope criteria
- Concepts and terminology
- Interfaces
- Databases
- Procedures

c. Discuss the following elements of the Configuration Management Program:

- Design requirements
- Document control
- Change control
- Assessments
- Design reconstitution adjunct
- Material condition and aging adjunct

d. Discuss the purpose, concepts, and general process for applying the graded approach to operational configuration management.

e. Identify the types of data and records required to be retained as permanent records.

f. Using the guidance in DOE-STD-1073-93, Guide for Operational Configuration Management Program, 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 the technical support for operation and maintenance activities or for Documented Safety Analysis reviews.

13. Waste management personnel shall demonstrate a familiarity level knowledge of monitoring techniques and monitoring equipment related to environmental compliance.

Supporting Knowledge and/or Skills

a. Describe the types of equipment used to monitor a site for the following:

- Ambient air quality
- Emissions
- Groundwater contamination
- Meteorological factors
- River and stream contamination
- Soil and sediment contamination
- Wildlife contamination

b. Describe the requirements of the following documents as they relate to environmental monitoring:

- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
- Resource Conservation and Recovery Act (RCRA)
- National Environmental Policy Act (NEPA)
- 40 CFR 61, NESHAPs

c. Describe the various quality assurance and quality control programs used to enhance data quality. Include in your discussion programs both internal and external to the Department.

d. Describe the standard methods for the examination of water and wastewater.

e. Given a sampling parameter/equipment, describe the standard sampling methods and protocols.

f. Explain the reason for measuring emissions, meteorological factors and ambient air quality under various operation conditions (e.g., routine and emergency).

g. Describe the purpose and limitations of the following air quality measurement instruments:

- High volume particulate sampler
- Liquid bubbler (e.g., for sulfur dioxide)
- Infrared spectrometer

h. Describe the purpose and types of material collected by the following sampling media:

- High efficiency glass fiber filter
- Activated charcoal cartridge
- Silica gel

i. Describe the purpose for measuring each of the following parameters during field surveys of water quality:

- Temperature
- Dissolved oxygen
- Conductivity
- pH

j. Discuss the factors that can affect readings and the preservation methods for the field measurements listed above.

k. Identify the types of data and records required to be retained as permanent records.

Mechanical Systems

14. Waste management personnel shall demonstrate a familiarity level knowledge of basic pneumatic and hydraulic systems in the areas of components, operations, and theory.

Supporting Knowledge and/or Skills

a. Define the following and discuss their relationship:

- Force
- Pressure
- Pneumatic
- Hydraulic

b. Describe the basic operation of a pneumatic system.

c. Describe the basic operation of a hydraulic system.

d. Identify the hazards associated with pneumatic and hydraulic systems and their components.

15. Waste management personnel shall demonstrate a familiarity level knowledge of valve construction, operations, and theory.

Supporting Knowledge and/or Skills

a. Given a drawing of a valve, identify the major component parts.

b. Given a drawing of a valve, identify which of the following type of valve it is:

- Gate

- Globe
- Relief/Safety
- Ball
- Check

c. Describe the construction and principle of operation for the following types of valve actuators:

- Manual
- Electric
- Solenoid
- Pneumatic
- Hydraulic

16 Waste management personnel shall demonstrate a familiarity level knowledge of basic strainer and filter construction, operations, and theory.

Supporting Knowledge and/or Skills

a. Describe the following types of filters, including an example of typical use:

- Cartridge filters
- Pre-coated filters
- Deep-bed filters
- HEPA filters

b. Describe the following types of strainers, including an example of typical use:

- Bucket strainer
- Duplex strainer

INTEGRATED SAFETY MANAGEMENT

17. Waste management personnel shall demonstrate familiarity level of knowledge of the following DOE Orders:

- DOE Order 420.1A, Facility Safety
- DOE Order 414.1A, Quality Assurance

Supporting Knowledge and/or Skills

a. Discuss the purpose, scope, and application of the listed Orders. Include in this discussion key terms, essential elements, and personnel responsibilities and authorities.

b. Discuss the contractor's responsibilities for environmental safety and health protection as stated in the above documents.

18. Waste management personnel shall demonstrate working level knowledge of the Occupational Safety and Health Act (OSHA) requirements (and Mine Safety and Health Act (MSHA) requirements where facility applicable) in the following documents:

- DOE Order 440.1A, Worker Protection Management for DOE Federal and Contractor Employees
- 29 CFR 1910, Occupational Safety and Health Standards
- 29 CFR 1926, Safety and Health Regulations for Construction
- 30 CFR 57. Safety and Health
- 30 CFR 58, Health Standards for Metal and Nonmetal Mines
- All other applicable portions of MSHA regulations found at 30 CFR Subchapters A-K (Parts 1-199)

Supporting Knowledge and/or Skills

a. Discuss the application and impact of OSHA and/or MSHA on Department projects.

b. Identify the requirements in the OSHA and/or MSHA that form the basis of authority for project management personnel in the oversight and management of a project.

c. Discuss the contractor's responsibility for providing necessary training to employees in the area of safety and health on the worksite.

d. Discuss the project manager's responsibility for on-site safety and health inspections.

e. Discuss the contractor's required response to an identified safety and/or health hazard.

19. Waste management personnel shall demonstrate a working level knowledge of Department of Energy radiation protection requirements sufficient to assess the effectiveness of radioactive material containment, exposure control, and radiological work practices.

Supporting Knowledge and/or Skills

a. Discuss the relevant Departmental requirements related to the following radiological control elements:

- Contamination control
- Radiation work permits
- Radiation safety training
- Posting and labeling
- Respiratory protection
- Records
- X-Ray generating devices

b. Describe and explain the radiological concerns in the design, construction, and operation of containment and confinement systems.

c. Discuss the design and operational characteristics of containment and confinement systems that minimize personnel radiation exposure.

20. Waste management personnel shall demonstrate a working level knowledge of the requirements for the use of personal protective equipment for chemical hazards, requirements for hazardous substances, and the impact of hazardous waste operations on worker safety and health.

Supporting Knowledge and/or Skills

a. Describe the principles governing the selection, use, and limitations of the following:

- Respirators
- Protective clothing
- MSHA approved self-rescue devices (at applicable sites)

b. Describe the various types of equipment (devices or clothing) worn to protect a worker from exposure to hazardous substances and physical injury.

c. Given a work procedure and atmospheric conditions, identify the appropriate type of respiratory protection for the activity.

d. Describe the four levels (A,B,C & D) of protection for workers at hazardous waste sites or for those workers conducting emergency response activities as defined by the Environmental Protection Agency.

e. Discuss the hazards associated with the use of corrosives (acids and alkali's).

f. Describe the general safety precautions necessary for the handling, storage, and disposal of corrosives.

g. Discuss the general safety precautions regarding toxic compounds.

h. Describe the criteria used to determine if a compound is a health hazard and discuss the methods by which toxic compounds may enter the body.

i. Discuss the general safety precautions regarding the use, handling, and storage of compressed gases, including but not limited to hydrogen, oxygen, and nitrogen.

j. Discuss the safety precautions for working with cryogenic liquids.

k. Explain the difference between a flammable liquid and a combustible liquid.

l. Describe the general safety precautions regarding the use, handling, and storage of flammable and combustible liquids.

m. Describe the industrial process associated with hazardous waste operations as they pertain to Waste Management.

n. Explain the personnel hazards associated with the following:

- Polychlorinated Biphenyls (PCB) handling
- Asbestos handling
- Biological hazards (such as Hanta virus, animal carcasses, and medical waste)
- Solvents
- Paint residual handling
- Waste oil

21. Waste management personnel shall demonstrate a working level knowledge of the principles, concepts, and requirements of environmental risk assessment.

Supporting Knowledge and/or Skills

a. Define risk assessment, risk management, and risk communication.

b. Describe the four steps of a risk assessment.

c. Describe how risk assessment helps in site decision-making.

d. Define the term “Baseline Risk Assessment.”

e. Describe the process for a Toxicity Assessment.

f. Describe the process for an Exposure Assessment.

g. Describe the process used to characterize risk.

h. Identify the types of data and records required to be retained as permanent records.

22. Waste management personnel shall demonstrate a working level knowledge of the purpose and requirements of DOE O 5400.5, Radiation Protection of the Public and Environment.

Supporting Knowledge and/or Skills

a. State the Department’s policy and discuss the objectives regarding the protection of the public and the environment from radiation as contained in DOE O 5400.5.

b. Define the following terms:

- As low as reasonably achievable (ALARA)
- Best available technology (BAT)
- Derived concentration guide (DCG)
- Absorbed dose
- Collective dose equivalent
- Collective effective dose equivalent
- Committed dose equivalent
- Committed effective dose equivalent
- Deep dose equivalent
- Dose equivalent
- Effective dose equivalent
- Public dose
- Weighting factor
- Quality factor
- Effluent monitoring
- Environmental surveillance
- Protective action guides
- Release of property
- Residual radioactive material
- Settleable solids
- Soil column

c. List and discuss the factors that must be considered pertaining to the release of materials and equipment having residual radioactive material as outlined in Chapter IV of the Order, Residual Radioactive Material Cleanup.

d. Identify and discuss the release criteria for:

- soil
- air/water
- surface
- real property

e. Describe the radiological liquid effluent requirements established in DOE O 5400.5, Radiation Protection of the Public and the Environment, and assess whether the effluent monitoring from a facility meets the requirements.

f. Assess whether adequate methods are used to characterize effluents for purposes of limiting doses to the public in accordance with regulatory and "as low as reasonably achievable (ALARA)" limits.

g. Assess whether the Environmental Radiological Protection Program is in accordance with DOE O 5400.5, Radiation Protection of the Public and Environment.

h. Identify the types of data and records required to be retained as permanent records.

AUTHORIZATION BASIS DOCUMENTATION

23. Waste management personnel shall demonstrate a familiarity level knowledge of Documented Safety Analyses as described in 10 CFR 830, Subpart B, Nuclear Safety Management.

Supporting Knowledge and/or Skills

a. Discuss the basic purposes and objectives of Nuclear Safety Analysis Reports.

b. Describe the responsibilities of contractors authorized to operate defense nuclear facilities regarding the development and maintenance of a Nuclear Safety Analysis Report.

c. Define the following terms and discuss the purpose of each:

- Design basis
- Authorization basis
- Engineered safety features
- Safety analysis
- Safety systems

d. Describe the requirements for the scope and content of a Nuclear Safety Analysis Report and discuss the general content of each of the required sections of a Nuclear Safety Analysis Report.

e. Discuss the ways that contractor management makes use of Nuclear Safety Analysis Reports.

f. Discuss the transportation safety requirements of 10 CFR 830 Subpart B.

g. Identify the types of data and records required to be retained as permanent records.

24. Waste management personnel shall demonstrate a familiarity level knowledge of Department of Energy (DOE) Technical Standard DOE-STD-1027, Hazard Categorization and Accident Anaylsis Techniques.

Supporting Knowledge and/or Skills

a. Using DOE-STD-1027 as a reference, discuss its purpose, applicability, and scope.

b. State the three levels of facility hazard categorization.

25. Waste management personnel shall demonstrate a familiarity level knowledge of nuclear criticality safety, with respect to its impact on Department nuclear safety.

Supporting Knowledge and/or Skills

a. Discuss the purpose and policy associated with the DOE Order 420.1A, Facility Safety, criticality safety requirements.

b. Define the following terms associated with nuclear criticality safety:

- Criticality incident
- Double contingency principle
- Geometry control
- Nuclear criticality safety
- Significant quantity of fissionable material
- Temporary exemption

c. Discuss the Contractor responsibilities for the following in relation to criticality safety activities:

- Criticality safety evaluations
- Monitoring
- Surveillance
- Transportation
- Storage

d. Identify the types of data and records required to be retained as permanent records.

26. Waste management personnel shall demonstrate a familiarity level knowledge of the Price-Anderson Amendment Act of 1988 and its impact on Department of Energy nuclear safety activities.

Supporting Knowledge and/or Skills

a. Describe the purpose and scope of the Price-Anderson Amendment Act.

b. Discuss the Act's applicability to the Department nuclear safety activities.

c. Discuss the civil and criminal penalties imposed on the Department, Management and Operating Contractors, and Subcontractors as the result of a violation of applicable rules and regulations related to nuclear safety.

d. Discuss the requirements associated with the topics below, as they are affected by Rule-making aspect of the Price-Anderson Amendment Act:

- Safety Analysis Reports
- Unreviewed Safety Questions
- Quality Assurance Requirements
- Technical Safety Requirements

FUNCTIONAL AREA SPECIFIC

27. Waste management personnel shall demonstrate a working level knowledge of Department of Energy (DOE) Order 450.1, Environmental Protection Program.

Supporting Knowledge and/or Skills

a. Define the following terms:

- Effluent
- Environmental Monitoring
- Environmental Protection Standard
- Effluent Monitoring
- Environmental Surveillance
- Environmental Occurrence
- Pollution Prevention

b. Discuss the Department's policy pertaining to the environmentally safe and sound operation of its facilities.

c. Discuss the requirements for Notification and Reports. Include the following as a minimum:

- Office of Management and Budget Circular A-106

d. Discuss the requirements for an Environmental Monitoring Plan.

28. Waste management personnel shall demonstrate a familiarity level knowledge of the Clean Air Act (CAA) and implementing regulations.

Supporting Knowledge and/or Skills

a. Discuss the application of the Clean Air Act to the Department of Energy and its facilities.

b. Identify the National Ambient Air Quality Standards (primary and secondary) and the National Emission Standards for Hazardous Air Pollutants (NESHAP) as they apply to attainment and non-attainment areas.

c. Describe the requirements for permitting, monitoring and reporting prescribed in the regulations that implement Title V of the Clean Air Act.

d. Discuss the potential liabilities of the Department of Energy and its contractors inherent in the enforcement of environmental regulations (i.e., compliance orders, enforcement actions, fines and penalties, and provisions for civil suits).

e. Identify the types of data and records required to be retained as permanent records.

29. Waste management personnel shall demonstrate a familiarity level knowledge of the following laws and regulations as related to the environmental medium of water:

- Clean Water Act (CWA)
- Safe Drinking Water Act (SDWA)
- Resource Conservation and Recovery Act (RCRA) (groundwater provisions)
- National Groundwater Protection Policy (NGPP)
- Oil Pollution Act

Supporting Knowledge and/or Skills

a. Discuss the application of the above laws to the Department of Energy and its facilities.

b. Discuss the Clean Water Act permitting requirements including monitoring and reporting. Include in the discussion, National Pollutant Discharge Elimination System Program and the Rivers and Harbors Act Dredge/Fill material permits, as applicable.

c. Discuss the standards for maximum contaminant levels (primary and secondary) contained in the Safe Drinking Water Act.

d. Identify the groundwater protection requirements applicable to interim status Resource Conservation and Recovery Act's (RCRA) facilities in RCRA's implementing regulations, Subpart F of 40 CFR 265.

e. Identify the groundwater protection requirements applicable to permitted Resource Conservation and Recovery Act (RCRA) facilities in RCRA's implementing regulations, Subpart F of 40 CFR 264 and in the facility's permit.

f. Explain the spill prevention and control requirements of the Clean Water Act (40 CFR 109-114).

g. Discuss how the National Pollution Discharge Elimination System applies to and impacts Department waste management programs.

h. Identify the types of data and records required to be retained as permanent records.

30. Waste management personnel shall demonstrate the ability to review the following National Environmental Policy Act documentation:

- Environmental Impact Statement (EIS)
- Environmental Assessment (EA)
- Finding Of No Significant Impact (FONSI)
- Categorical Exclusion (CX)
- Record of Decision (ROD)

Supporting Knowledge and/or Skills

a. Explain the purpose and scope of the Council on Environmental Quality Regulations implementing the National Environmental Policy Act (40 CFR 1500-1508).

b. Discuss the purpose and scope of DOE O 451.1A, National Environmental Policy Act Compliance Program and the relationship with 40 CFR 1500.

c. Discuss the content and procedures specified by the Department implementing regulations 10 CFR 1021, Compliance with the National Environmental Policy Act and Secretarial Policy on the National Environmental Policy, June 13, 1994.

d. Discuss the applicability for each of the documents identified above and the responsibilities for reviewing these documents.

e. Discuss the different areas that are analyzed in an EIS to determine the affect on the environment (i.e. geologic resources, groundwater, meteorology, ecological, public health and safety, etc.).

f. Describe the public participation process.

g. Discuss the integration of consultation requirements under other environmental legislation (e.g., National Environmental Policy Act and Endangered Species Act and Fish and Wildlife Coordination Act).

h. Discuss the potential liabilities of the Department and its contractors inherent in the NEPA process.

i. Identify the types of data and records required to be retained as permanent records.

31. Waste management personnel shall demonstrate a familiarity level knowledge of the following as it relates to waste management.

- Atomic Energy Act
- Low Level Waste Policy Amendment Act

Supporting Knowledge and/or Skills

a. Discuss the responsibilities of states and the federal government identified under the Atomic Energy Act.

b. Define the following terms and their implications for regulation in the Department of Energy:

   - Agreement State
   - Allocation
   - Compact
   - Sited Compact Region

c. Describe the federal government disposal responsibilities under the Low Level Waste Policy Amendment Act (LLWPAA).

d. Identify the federal government responsibilities for disposing of low level waste at a non-federal facility per the LLWPAA.

32. Waste management personnel shall demonstrate a working level knowledge of the storage and disposal of Polychlorinated Biphenyl (PCB) waste as regulated by 10 CFR Part 761.

Supporting Knowledge and/or Skills

a. Describe the structure and properties of PCBs.

b. Discuss PCB decomposition products and their toxicity.

c. Explain why PCBs are banned or otherwise controlled.

d. Explain the two types of PCB hierarchy and position an item/material in the PCB hierarchy (e.g., PCB liquid / non-liquid, PCB Items).

e. Discuss how the PCB concentration is established.

f. Determine whether an item/material is a PCB waste.

g. Discuss the marking of PCB transport vehicles.

h. Discuss PCB storage requirements including time limitations, temporary storage, general storage unit requirements, alternate storage units, container requirements, inspection requirements, and markings.

i. Define PCB/Radioactive Waste and explain how it differs with regard to exemptions to time and general storage requirements. Discuss how PCB/Radioactive Waste is disposed (e.g., discuss the special provisions of 10 CFR 761.50(b)(7)).

j. Discuss PCB disposal requirements including disposal prohibitions, combustion, and landfilling.

k. Define PCB Remediation Waste and discuss how it is disposed.

l. Define PCB Bulk Product Waste and discuss how it is disposed.

m. Define PCB Waste from Research and Development Activities and discuss how it is disposed.

n. Define PCB Waste from Decontamination Waste and Residues and discuss how it is disposed.

o. Discuss PCB spill reporting and cleanup.

33. Waste management personnel shall demonstrate a working level knowledge of the reporting of the releases of hazardous chemicals and community right-to-know reporting as regulated by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA).

Supporting Knowledge and/or Skills

a. Identify the statutes, regulations, and executive orders governing release reporting and community right-to-know reporting.

b. Discuss the importance of complying with the release reporting and community right-to-know reporting.

c. Define a CERCLA hazardous substance.

d. Define Reportable Quantities (RQs) and explain how RQs are applied and used.

e. Discuss how it is determined if a release is reportable under CERCLA. Explain for releases containing only one hazardous substance and for releases containing mixtures of hazardous substances. Discuss exemptions to the reporting requirements.

f. Discuss how releases of hazardous substances are identified and the reporting requirements including time, to whom and by whom, definition of facility, definition of environment.

g. Discuss the purpose of the Emergency Planning and Community Right-To-Know Act and DOE's role in its implementation within a community.

h. Define Threshold Planning Quantities (TPQs).

i. Discuss DOE's responsibilities for facilities which contain greater than TPQs.

j. Identify the four characteristics of a sound EPCRA program at a DOE site.

34. Waste management personnel shall demonstrate a working level knowledge of the Federal Facility Compliance Act of 1992 (FFCAct).

Supporting Knowledge and/or Skills

a. Discuss the major requirements of the FFCAct including:

- Waiver of Sovereign Immunity for DOE
- Mixed Waste Inventory Report
- Mixed Waste Treatment Capacities and Technologies Report
- Chief Financial Officer's Report
- Site Treatment Plan
- State Agreement (Consent Order)

b. Discuss the content of the Site Treatment Plan at the site including the identification of mixed waste streams, the development of treatment capacities, technology development needs, and schedules. Explain how the Site Treatment Plan is maintained (e.g., updated).

c. Discuss the content of the Consent Order at the site including the requirements for identification of new waste streams, treatment of mixed waste from offsite, adherence to schedules, changes to treatment strategy, updates and revisions, and penalties for non-compliance.

35. Waste management personnel shall demonstrate a familiarity level knowledge of the supporting environmental laws and regulations including:

- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)
- Endangered Species Act (ESA)
- National Historic Preservation Act
- American Indian Religious Freedom Act
- DOE American Indian Policy

Supporting Knowledge and/or Skills

a. Describe the process for licensing applicators as defined in the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).

b. Discuss the Endangered Species Act consultation requirements.

c. Discuss the requirements of the National Historic Preservation Act and the American Indian Religious Freedom Act.

d. Discuss the Department's policy on American Indians.

36. Waste management personnel shall demonstrate a working level knowledge of the management and negotiation of regulatory requirements.

Supporting Knowledge and/or Skills

a. Describe the responsibilities involved with the management of documents such as:

- National Pollutant Discharge Elimination System Permit
- Federal Facility Agreement
- Consent Orders & Settlement Agreements
- Record Of Decision
- Resource Conservation and Recovery Act Part B Permit
- Grant conditions
- Monitoring requirements

b. Discuss the requirements and methods of negotiation for documents such as:

- National Pollutant Discharge Elimination System Permit
- Federal Facility Agreement
- Consent Order & Settlement Agreements
- Record Of Decision
- Resource Conservation and Recovery Act Part B Permit
- Grant conditions
- Monitoring requirements

37. Waste management personnel shall demonstrate a familiarity level knowledge of how environmental laws and regulations are enforced.

Supporting Knowledge and/or Skills

a. Discuss the interrelationship between the following:

- Environmental law
- The United States Code
- The Code of Federal Regulations
- State Laws and Regulations

b. Describe the organization, mission, and enforcement authorities of the Environmental Protection Agency (EPA) and applicable state regulatory agencies.

c. Discuss the role of the Department's legal counsel in Waste Management activities.

d. Discuss the enforcement of environmental statutes under civil and criminal authorities.

e. Discuss the potential liabilities of the Department and its contractors inherent in the enforcement of environmental regulations (i.e., compliance orders, enforcement actions, fines and penalties, and provisions for civil suits).

38. Waste management personnel shall demonstrate a familiarity level knowledge of the development, review, and assessment of the following Comprehensive Environmental Response, Compensation, and Liability Act documentation.

- Remedial Investigation Feasibility Study
- Investigative Work Plan Report
- Permits
- National Pollution Discharge Elimination System
- Record of Decision
- Remedial Design
- Remedial Work Plan
- Consent Order & Settlement Agreement

Supporting Knowledge and/or Skills

a. Describe the process for developing the listed documents.

b. Discuss the requirements for each document and describe the process for reviewing the listed documents.

c. Discuss the use of non-time critical removal action process as it applies to conducting decommissioning activities.

39. Waste management personnel shall demonstrate working level knowledge of hazardous waste as described in 40 CFR, Resource Conservation and Recovery Act.

Supporting Knowledge and/or Skills

a. Define the term "hazardous waste."

b. Using the decision tree in 40 CFR Part 260, relate RCRA solid waste to hazardous waste and identify the applicable RCRA regulations for each.

c. Identify the kinds of hazardous wastes generated within the Department and their sources.

d. Describe the combination of treatment, storage, and disposal facilities used to manage hazardous wastes.

e. Discuss the current methods of disposing of hazardous wastes.

f. Discuss regulatory requirements imposed on generators of hazardous wastes required by 40 CFR 262 related to the following:

- Accumulating waste
- Preparing hazardous waste for shipment
- Preparing a uniform hazardous waste manifest

g. For Resource Conservation and Recovery Act permitted facilities and interim status facilities discuss the following as required by 40 CFR 264 and 40 CFR 265:

- General facility standards
- Preparedness and prevention requirements
- Contingency plan and emergency procedures
- Manifest and record keeping requirements
- Releases from solid waste management units
- Closure requirements
- Use and management of containers
- Tank systems
- Landfills

h. Discuss the Resource Conservation and Recovery Act regulatory requirements for:

- Recyclable materials
- Incinerators, and
- Disposal facilities

i. Describe the treatment standards required under the Land Disposal Restrictions, and describe the prohibition on storage as required by 40 CFR 268.

j. Discuss Resource Conservation and Recovery Act permitting requirements and requirements associated with modifying permits, as defined in 40 CFR 270.

k. Explain the relationship between the Resource Conservation and Recovery Act and the Federal Facilities Compliance Act (FFCAct). Include in your discussion the development of Site Treatment Plans and development of Waste Treatment Technologies.

l. Describe the types of facilities that need Resource Conservation and Recovery Act permits; list differences between a RCRA Part A and a RCRA Part B permit application; and give examples of RCRA Part B permit application requirements that apply to all facilities and those that apply to specific types of facilities.

m. Describe how to determine if a material is a solid waste. Given a material that is a solid waste, describe how to determine if it is a hazardous or a mixed waste.

n. Discuss the Land Disposal Restrictions, including the different types of treatment standards, the dilution prohibition, the storage prohibition, and different types of variances and exemptions.

o. Discuss the regulatory requirements applicable to Federal facility solid waste landfills (including Resource Conservation and Recovery Act Subtitle D).

p. Discuss the Personal Protective Equipment (PPE) requirements for work activities in hazardous areas.

q. Discuss the potential liabilities of the Department of Energy and its contractors inherent in the enforcement of environmental regulations (i.e., compliance orders, enforcement actions, fines and penalties, and provisions for civil suits).

r. Discuss the Resource Conservation and Recovery Act underground storage tank regulations (Subtitle I).

s. Describe the relationship of the Hazardous Materials Transportation Act (49 CFR Parts 170-179) to the Resource Conservation and Recovery Act transportation regulations (40 CFR Part 263).

t. Identify the types of data and records required to be retained as permanent records.

40. Waste management personnel shall demonstrate working level knowledge of the management of low-level radioactive waste as described in DOE O 435.1, Radioactive Waste Management, and any accompanying office or site specific implementation plan.

Supporting Knowledge and/or Skills

a. Define low-level waste.

b. State the requirements for LLW management including mixed low-level, TSCA-Regulated, Accelerator-Produced, 11e.(2) and naturally occurring radioactive material waste.

c. State the requirements for treatment, storage and disposal facility operations.

d. Discuss the Complex-wide Low-level Waste Management Program.

e. Review and evaluate the specific management controls included in the Radioactive Waste Management Basis.

f. Discuss contingency actions for storage and transfer equipment.

g. Discuss waste acceptance requirements for low-level waste.

h. Discuss life cycle planning and waste with no identified path to disposal as it relates to waste generation planning.

i. Discuss the minimum relevant information for characterizing low-level waste.

j. Discuss the waste certification program for low-level waste.

k. Discuss the packaging and transportation requirements for low-level waste.

l. Discuss storage prohibitions for low-level waste.

m. Evaluate the attainment of the performance objectives for disposal of low-level waste.

n. Review and evaluate a Performance Assessment.

o. Review and evaluate a Composite Analysis.

p. Discuss the maintenance requirements for Performance Assessments and Composite Analysis.

q. Discuss the closure plan requirements for disposal facility operations.

r. Discuss the monitoring requirements for low-level waste facilities.

s. Identify the types of data and records required to be retained as permanent records.

41. Waste management personnel shall demonstrate a working level knowledge of the management of transuranic waste as described in Department of Energy (DOE) Order 435.1, Radioactive Waste Management, and any accompanying office or site specific implementation plan.

Supporting Knowledge and/or Skills

a. Define the term "transuranic waste" (TRU) including the requirements for classification of transuranic waste and the lower concentration limit below which transuranic waste may be considered low-level waste.

b. Evaluate and determine the requirements for management of transuranic, mixed transuranic and TSCA-Regulated waste.

c. Review and evaluate the site Radioactive Waste Management Basis.

d. Evaluate and determine the waste acceptance requirements for all transuranic waste storage, treatment, or disposal facilities.

e. Discuss life-cycle planning and waste with no identified path to disposal as it relates to waste generation planning.

f. Evaluate and determine the minimum relevant information for characterizing transuranic waste.

g. Discuss the waste certification program for transuranic waste.

h. Discuss the packaging and transportation requirements for transuranic waste.

i. Evaluate and determine the storage prohibitions for transuranic waste.

j. Evaluate and determine the monitoring requirements for transuranic waste facilities.

k. Identify the types of data and records required to be retained as permanent records.

42. Waste management personnel shall demonstrate a working level knowledge of the management of High-Level Waste and/or other materials which, because of their highly radioactive nature, require similar handling as described in DOE Order 435.1, Radioactive Waste Management, and any accompanying office or site specific implementation plan.

Supporting Knowledge and/or Skills

a. Define the term "high-level waste," and list potential sources of high-level waste from operations within the Complex.

b. Define “waste incidental to reprocessing” and explain how it is managed.

c. Evaluate and determine the requirements for treatment, storage and disposal facility operations.

d. Evaluate and determine the requirements for management of high level waste including mixed high-level and TSCA-regulated waste.

e. Review and evaluate the site Radioactive Waste Management Basis.

f. Evaluate and determine the contingency actions for storage and transfer equipment.

g. Identify when operations must be curtailed.

h. Evaluate and determine the minimum waste acceptance requirements for all high level waste storage, pretreatment, or treatment facilities, operation and activities.

i. Discuss in the waste generation planning, life-cycle planning and waste with no identified path to disposal.

j. Discuss the waste certification program.

k. Review and evaluate the structural integrity program for tanks.

l. Evaluate and determine the areas to be monitored for high-level waste pretreatment, treatment, storage and transportation facilities.

m. Identify the types of data and records required to be retained as permanent records.

43. Waste management personnel shall demonstrate a working level knowledge of the packaging and transportation of waste as described in DOE Order 460.1A, Packaging and Transportation Safety and DOE Order 460.2, Departmental Materials Transportation and Package Management.

Supporting Knowledge and/or Skills

a. Discuss the requirements of the Hazardous Materials Transportation Act as they relate to the packaging and transportation of waste.

b. Describe the requirements for selecting shipping containers.

c. Discuss the labeling, placarding, and shipping requirements specified in the requirements of 49 CFR (Placarding, Labeling, and Shipping).

44. Waste management personnel shall demonstrate the ability to appraise the contractor's program(s) and/or permits to assess compliance with the requirements for Waste Management.

Supporting Knowledge and/or Skills

a. Assess the contractor's plans and procedures for low-level, transuranic, mixed and high level waste to ensure compliance with the DOE O 435.1.

b. Given a proposed permit application for mixed waste, evaluate it for compliance with the Resource Conservation and Recovery Act requirements.

c. Assess the contractor's plans and procedures for waste generation to ensure compliance with DOE O 435.1.

45. Waste management personnel shall demonstrate a familiarity level knowledge of 29 CFR 1910.119, Process Safety Management of Highly Hazardous Chemicals.

Supporting Knowledge and/or Skills

a. State the purpose and applicability of 29 CFR 1910.119.

b. As contained in 29 CFR 1910.119, describe the role Departmental waste management personnel play in:

- The development and review of a contractor's operating procedures
- The evaluation of a contractor's training program
- Compliance audit requirements

c. Discuss a contractor's responsibilities to the Department regarding the operation of facilities containing highly hazardous chemicals.

d. List the safety and health considerations associated with hazardous chemicals as outlined in 29 CFR 1910.119.

e. Discuss the non-mandatory Compliance Guidelines and Recommendations for Process Safety Management contained in 29 CFR 1910.119.

46. Waste management personnel shall demonstrate a familiarity level knowledge of Inter-Agency Agreements (IAG), Agreements in Principle (AIPs), and Department Consent and Compliance Orders (CCOs) that are applicable to waste management programs.

Supporting Knowledge and/or Skills

a. Discuss how Inter-Agency Agreements and Agreements in Principal apply to and impact Department waste management programs.

b. Describe how Inter-Agency Agreements and Agreements in Principal are developed and entered into by the Department.

c. Describe Consent and Compliance Orders and discuss how they apply to and impact Department waste management programs.

d. Given a list of Consent and Compliance Orders, identify those that are applicable to waste management programs.

e. Identify the requirements contained in Consent and Compliance Orders that form the basis of the authority for waste management personnel in the oversight and management of Department facilities.

f. Discuss how the requirements of site-specific Consent and Compliance Orders are addressed by appropriate programs.

47. Waste management personnel shall demonstrate a familiarity level knowledge of Department Notice of Violations (NOVs) that are applicable to waste management programs.

Supporting Knowledge and/or Skills

a. Describe Notice of Violations and discuss how they apply to and impact Department waste management programs.

b. Given a list of Notice of Violations, identify those that are applicable to waste management programs.

c. Given several Notice of Violations that are applicable to waste management programs, identify the violations, describe the corrective actions to be taken, and determine the status of implementation of the corrective actions.

d. Discuss the potential liabilities of the Department of Energy and its contractors inherent in the enforcement of environmental regulations (i.e., compliance orders, enforcement actions, fines and penalties, and provisions for civil suits).

48. Waste management personnel shall demonstrate a familiarity level knowledge of the Pollution Prevention Act of 1990 (PPA).

Supporting Knowledge and/or Skills

a. Define the following terms:

- Pollution/pollutants
- Recycling
- Waste minimization
- Pollution prevention

b. Discuss the Department's policy pertaining to the pollution prevention.

c. Define source reduction and provide a list of source reduction technologies.

d. Discuss the purpose of Executive Order 12856, Federal Compliance with Right-to-Know laws and Pollution Prevention Requirements.

e. Discuss the purpose of Executive Order 13101, Greening Government through Waste Prevention, Recycling, and Federal Acquisition.

f. Discuss how the Pollution Prevention Act applies to and impacts Department waste management programs.

g. Identify the requirements contained in the Pollution Prevention Act that apply to waste management.

49. Waste management personnel shall demonstrate a working level knowledge of financial management necessary to integrate program resources and apply those resources to meet project commitments as described in Department of Energy (DOE) Guide 430.1-1, Life Cycle Asset Management.

Supporting Knowledge and/or Skills

a. Define the term “Work Breakdown Structure” and discuss the process for developing one.

b. Define and compare the terms "cost estimate" and "budget."

c. Describe the process for preparing cost estimates and budgets.

d. Describe and compare labor and non-labor costs.

e. Describe and compare direct and indirect costs.

f. Discuss methods of reducing indirect costs.

g. Discuss the importance of determining the measure for work performed before work starts.

h. Describe methods for measuring work performed.

i. Discuss schedule and cost variance.

j. Given actual project management documentation and data, identify budgeted cost of work scheduled, budgeted cost of work performed, actual cost of work performed, and determine the schedule variance and cost variance.

k. Describe the types of Earned Value and how they are measured.

l. Explain what is meant by the term "baseline" as it relates to project management.

m. Describe the types of data required to forecast cost and schedule performance.

n. Define the term "Life Cycle Cost Estimate."

o. Given sample data, calculate "Life Cycle Cost Estimate."

p. Discuss the importance of formal change control with regard to project management.

q. Discuss the use of strategic planning, and how such planning relates to ongoing operations and safety of operations.

r. Establish the terms of contractor performance elements and monitor and asses contractor performance against those performance elements.

REQUALIFICATION REQUIREMENTS

None.

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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 DOE personnel after completion of the competency requirements in this technical Functional Area Qualification Standard. It is extremely important that personnel involved with this program maintain their proficiency through 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.

LIST OF CONTINUING EDUCATION, TRAINING AND OTHER ACTIVITIES

Waste management personnel shall participate in an Office/Facility-specific continuing training and qualification program that includes the following elements:

1. Continuing technical education and/or training covering topics directly related to the waste management area as determined appropriate by management. This may include courses/training provided by Department of Energy, 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 a waste management specialist at a Department of Energy facility a minimum of 24 hours per year.

3. Specific continuing training requirements shall be documented in Individual Development Plans.

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CONCLUDING MATERIAL

Review Activity:
EM
DP-NNSA
EH
NE
SC

Preparing Activity:
DOE-EM-5

Project Number:
TRNG-0028

Field and Operations Offices
CBFO
CH
ID
OH
OR
ORP
RFFO
RL
SRO

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
Sandia Site Office
Savannah River Site Office
Y-12 Site Office