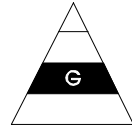




DOE G 450.4-1A
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Volume 2 of 2



INTEGRATED SAFETY MANAGEMENT SYSTEM GUIDE

for use with

**SAFETY MANAGEMENT SYSTEM POLICIES (DOE P 450.4, DOE P 450.5,
AND DOE P 450.6); THE FUNCTIONS, RESPONSIBILITIES, AND
AUTHORITIES MANUAL; AND THE DEPARTMENT OF ENERGY
ACQUISITION REGULATION**



Volume Two: Appendixes

**Assistant Secretary for
Environment, Safety and Health**

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CANCELED

APPENDIX A

GLOSSARY

ADMINISTRATIVE CONTROLS. Provisions relating to organization and management, procedures, record keeping, assessment, and reporting necessary to ensure safe operation of a facility. With respect to nuclear facilities, *administrative controls* means the section of the Technical Safety Requirements (TSRs) containing provisions for safe operation of a facility including (1) requirements for reporting violations of TSRs, (2) staffing requirements important to safe operations, and (3) commitments to the safety management programs and procedures identified in the Safety Analysis Report as necessary elements of the facility safety basis provisions.

AUTHORIZATION AGREEMENT. A documented agreement between the Department of Energy (DOE) and the contractor for high-hazard facilities (Categories 1 and 2), incorporating the results of DOE's review of the contractor's proposed authorization basis for a defined scope of work. The authorization agreement contains key terms and conditions (controls and commitments) under which the contractor is authorized to perform work. Any changes to these terms and conditions would require DOE approval.

AUTHORIZATION BASIS. Safety documentation supporting the decision to allow a process or facility to operate. Included are corporate operational and environmental requirements as found in regulations and specific permits, and, for specific activities, work packages or job safety analyses. (See also *nuclear safety authorization basis*.)

AUTHORIZATION PROTOCOLS. Those processes used to communicate acceptance of the contractor's integrated plans for hazardous work. Such protocols are expected to range from preperformance review and approval by DOE of detailed safety-related terms and conditions for performing work (authorization agreement) to less rigorous oversight and postperformance assessment of the contractor's work.

CHANGE CONTROLS. A process that ensures all changes are properly identified, reviewed, approved, implemented, tested, and documented.

COGNIZANT SECRETARIAL OFFICER. That first-tier Headquarters office with responsibility and authority for the particular activity under consideration.

CONTRACTING OFFICER. A DOE official with the authority to purchase or contract for goods and services in excess of \$25,000. Contracting officers are appointed using Standard Form 1402, following procedures in DOE O 541.1, APPOINTMENT OF CONTRACTING

OFFICERS AND CONTRACTING OFFICER REPRESENTATIVES, which superseded DOE 4200.4A. For Headquarters support contracts, the contracting officer is generally a member of the staff of the Assistant Secretary for Human Resources and Administration.

CONTRACTOR. Any person under contract (including subcontractors or suppliers) with DOE with the responsibility to perform activities or supply services or products.

CORE SAFETY MANAGEMENT FUNCTIONS. The core safety management functions for DOE P 450.4, SAFETY MANAGEMENT SYSTEM POLICY, which are to (1) define the scope of work, (2) analyze the hazards; (3) develop and implement hazard controls; (4) perform work within controls; and (5) provide feedback and continuous improvement. These functions are also identified in DOE Acquisition Regulations (DEAR) 48 CFR 970.5204-2(c).

CORE TECHNICAL GROUP (CTG). The CTG maintains a system and process to share Federal technical resources within DOE and across organizational lines. A database is maintained by technical specialty area to assist customers in identifying the best individuals or mixes of expertise needed to support the customer's projects.

DEACTIVATION. The process of placing a facility in a stable and known condition, including the removal of hazardous and radioactive materials to ensure adequate protection of the worker, public health and safety, and the environment, thereby limiting the long-term cost of surveillance and maintenance. Actions include the removal of fuel, draining and/or de-energizing nonessential systems, removal of stored radioactive and hazardous materials, and related actions. Deactivation does not include all decontamination necessary for the dismantlement and demolition phase of decommissioning (e.g., removal of contamination remaining in the fixed structures and equipment after deactivation).

DECOMMISSIONING. Takes place after deactivation and includes surveillance and maintenance, decontamination, and/or dismantlement. These actions are taken at the end of the life of a facility to retire it from service with adequate regard for the health and safety of workers and the public and protection of the environment. The ultimate goal of decommissioning is unrestricted release or restricted use of the site.

DECONTAMINATION. The removal or reduction of residual radioactive and hazardous materials by mechanical, chemical, or other techniques to achieve a stated objective or end condition.

DEFENSE IN DEPTH. An approach to facility safety that builds in layers of defense against release of hazardous materials so that no one layer by itself, no matter how good, is completely relied upon. To compensate for potential human and mechanical failures, defense in depth is based on several layers of protection with successive barriers to prevent the release of hazardous material to the environment. This approach includes protection of the barriers to avert damage to

the plant and to the barriers themselves. It includes further measures to protect the public, workers, and the environment from harm in case these barriers are not fully effective.

DIRECTIVES. Includes Policies, Regulations, Orders, Notices, Manuals, Guides, and Technical Standards, as defined in DOE M 251.1-1A, under Chapter 1, “General Directives Structure,” Section 3, “Description,” and as also described in DOE P 151.1.

DISPOSITION. Those activities that follow completion of program mission, including, but not limited to, surveillance and maintenance, deactivation, and decommissioning.

ENHANCED WORK PLANNING. A process that evaluates and improves the program by which work is identified, planned, approved, controlled, and executed. The key elements of enhanced work planning are line management ownership; a graded approach to work management based on risk and complexity; worker involvement beginning at the earliest phases of work management; organizationally diverse teams; and organized, institutionalized communication.

ENGINEERED CONTROLS. Physical controls, including set points and operating limits; as distinct from administrative controls.

ENVIRONMENTAL MANAGEMENT SYSTEM. That part of the overall management system that includes organizational structure, planning activities, responsibilities, practices, procedures, processes, and resources for developing, implementing, achieving, reviewing, and maintaining the environmental policy (see DOE/EH-0573 and <http://www.qs9000.com/iso14000.html>).

EXTERNAL EVENTS. Natural phenomena or man-caused hazards not related to the facility.

FACILITY. The buildings, utilities, structures, and other land improvements associated with an operation or service and dedicated to a common function.

FIELD ELEMENT. A non-Headquarters DOE organization that is geographically distinct. Field elements can be area offices; support offices; operations offices; field offices; regional offices; or offices located at environmental restoration, construction, or termination sites.

“FLOOR-LEVEL” PROCEDURES. Detailed instructions used by technicians, researchers, and other workers to directly accomplish work activities or tasks.

GUIDING PRINCIPLES. Conditions for performance of work that a safety management system must address. The guiding principles for the Safety Management System Policy (DOE P 450.4) are *Line Management Responsibility for Safety, Clear Roles and Responsibilities, Competence Commensurate with Responsibilities, Balanced Priorities, Identification of Safety Standards and Requirements, Hazard Controls Tailored to Work Being Performed, and Operations Authorization*. These principles are also identified in DEAR 48 CFR 970.5204-2(b).

HAZARD. A source of danger (i.e., material, energy source, or operation) with the potential to cause illness, injury, or death to personnel or damage to a facility or to the environment (without regard to the likelihood or credibility of accident scenarios or consequence mitigation).

HAZARD ANALYSIS. The determination of material, system, process, and plant characteristics that can produce undesirable consequences, followed by the assessment of hazardous situations associated with a process or activity. Largely qualitative techniques are used to pinpoint weaknesses in design or operation of the facility that could lead to accidents. The SAR hazard analysis examines the complete spectrum of potential accidents that could expose members of the public, on-site workers, facility workers, and the environment to hazardous materials.

HAZARD CLASSIFICATION. Evaluation of the consequences of unmitigated releases, performed to classify facilities or operations into the following hazard categories:

- Category 1: The hazard analysis shows the potential for significant off-site consequences.
- Category 2: The hazard analysis shows the potential for significant on-site consequences.
- Category 3: The hazard analysis shows the potential for significant localized consequences.

HAZARDS CONTROLS. Design features; operating limits; and administrative or safety practices, processes, or procedures to prevent, control, or mitigate hazards.

HEAD OF THE CONTRACTING ACTIVITY. Head of a DOE element who has been delegated authority by the Deputy Assistant Secretary for Procurement and Assistance Management to (1) award and administer contracts, sales contracts, and/or financial assistance instruments; (2) appoint contracting officers; and (3) exercise the overall responsibility for managing the contracting activity.

IMPLEMENTATION PLAN. A document prepared by a contractor that sets forth (1) when and how the actions appropriate to comply with DOE or other regulatory requirements, including the requirements of a plan or program committed to by the contractor, shall be taken, and (2) what relief will be sought if a contractor cannot attain full compliance with a requirement in a reasonable manner.

INTEGRATED SAFETY MANAGEMENT SYSTEM. A Safety Management System (SMS) to systematically integrate safety into management and work practices at all levels as required by DOE P 450.4, SAFETY MANAGEMENT SYSTEM POLICY, and the other related Policies: DOE P 450.5 AND DOE P 450.6.

LIFE CYCLE. The life of an asset from planning through acquisition, maintenance, operation, and disposition.

LINE MANAGEMENT. Any management level within the line organization, including contractor management, that is responsible and accountable for directing and conducting work.

LINE ORGANIZATION. That unbroken chain of command that extends from the Office of the Secretary to Secretarial Offices that set program policy and plans and develop assigned programs, to the field element organizations responsible for execution of these programs, to the contractors that conduct the work.

MANAGEMENT CONTROLS (INTERNAL CONTROLS). The organization, procedures, and methods managers use to achieve their goals, including processes for planning, organizing, directing, and controlling operations. Management controls are designed to provide reasonable assurance that (1) programs achieve intended results; (2) resource use is consistent with DOE's mission and resources are protected from waste, loss, unauthorized use, and misappropriation; (3) laws and regulations are followed; and (4) decisions are based on reliable data. Management controls apply to all programs and administrative functions.

MANUALS/CODES OF PRACTICE. As applied to integrated safety management, documented instructions that define methods, processes, and procedures for DOE and the contractor to use in implementing safety requirements and guidelines. These manuals/codes of practice document the safety infrastructure of an ISMS and provide the basis for work planning, authorization protocols, formality of operations, and feedback and improvement processes.

NUCLEAR SAFETY. Aspects of safety that encompass activities and systems that present the potential for (1) uncontrolled releases of fission products or other radioactive materials to the environment or (2) inadvertent criticality.

NUCLEAR SAFETY AUTHORIZATION BASIS. The basis for the safe operation of a DOE nuclear facility, *nuclear safety authorization basis* includes hazard classification documents, Safety Analysis Reports, TSRs, DOE-issued safety evaluation reports, and facility-specific commitments made to comply with DOE nuclear safety requirements.

OCCURRENCE REPORT. A documented evaluation of an event or condition that is prepared in sufficient detail to enable the reader to assess its significance, consequences, or implications and to evaluate the actions being proposed or employed to correct the condition or to avoid recurrence.

OPERATIONAL READINESS REVIEW/ASSESSMENT. A disciplined, systematic, documented, performance-based examination of facilities, equipment, personnel, procedures, and management control systems to ensure that a facility will be operated safely within its approved safety envelope as defined by the facility safety basis.

OPERATIONAL SAFETY CONTROLS. Safety limits, operating limits, surveillance requirements, safety boundaries, and management and administrative controls that significantly contribute to protecting workers, the public, and the environment from hazards other than nuclear detonation, high-explosive detonation and deflagration, and fire (which are addressed by Nuclear Explosive Safety Rules) for specific nuclear explosive operations and associated activities.

OVERSIGHT. Assessment of the adequacy of DOE and contractor performance. The Assistant Secretary for Environment, Safety and Health has the responsibility and authority to independently assess the adequacy of DOE and contractor performance. Under DOE P 450.5, DOE line management also has responsibility for assessment of the adequacy of the contractor's ES&H performance.

PERFORMANCE INDICATOR. Operational information indicative of the performance or condition of a facility, group of facilities, or site.

PERFORMANCE-BASED REGULATIONS. Regulations that are outcome-oriented rather than procedure-oriented.

POLLUTION PREVENTION. The use of materials, processes, and practices that reduce or eliminate the generation and release of pollutants, contaminants, hazardous substances, and waste into land, water, and air. For DOE, this includes recycling activities.

PROCEDURE. A document that prescribes a process (a sequence of actions) to be performed to achieve a desired outcome.

PROCESS. A series of actions that achieves an end or result.

PROGRAM MANAGER.

- a. (Chief Financial Officer) An individual in an organization or activity responsible for the management of a specific function or functions and responsible for budget formulation and execution of the approved budget. The individual is the recipient of an approved funding program from the Office of Chief Financial Officer identifying his or her program dollars available to accomplish the assigned function.
- b. (Environment, Safety and Health) The Headquarters individual, or his/her designee, designated by and under the direction of a Secretarial Officer, who is directly involved in the operation of facilities under his/her cognizance, and holds signature authority to provide technical direction through heads of field elements/operations office organizations to contractors for these facilities.

PROGRAM OFFICE. A Headquarters organization responsible for executing program management functions and for assisting and supporting field elements in safety and health, administrative, management, and technical areas.

PROGRAM SECRETARIAL OFFICERS (PSO). See SECRETARIAL OFFICER.

RISK. The quantitative or qualitative expression of possible loss that considers both the probability that a hazard will cause harm and the consequences of that event.

RISK-INFORMED. Using knowledge of the risk.

SAFETY ANALYSIS. A documented process to (1) provide systematic identification of hazards within a given DOE operation; (2) describe and analyze the adequacy of the measures taken to eliminate, control, or mitigate identified hazards; and (3) analyze and evaluate potential accidents and their associated risks.

SAFETY ANALYSIS REPORT (SAR). A report that documents the safety analysis for a nuclear facility to provide the basis for a determination that the facility can be constructed, operated, maintained, shut down, and decommissioned safely and in compliance with applicable laws and regulations.

SAFETY CONTROLS. Safety significant controls or safety class controls (see also administrative controls).

SAFETY DOCUMENTATION. Reports, memorandums, and other signed and dated documents that identify the hazards of a process or facility, and describe the measures for their control.

SAFETY ENVELOPE. The range of conditions covered by the safety documentation of a process or facility under which safe operation is adequately controlled.

SAFETY EVALUATION REPORT (SER). A DOE document that describes the extent and detail of DOE review of a SAR or equivalent analysis report, the bases for approving the SAR (or equivalent), and any conditions of SAR (or equivalent) approval. Approval signifies that DOE has accepted the analysis as appropriately documenting the safety basis of a facility and as serving as the basis for operational controls necessary to maintain an acceptable operating safety envelope.

SAFETY CLASS STRUCTURES, SYSTEMS, AND COMPONENTS. Nuclear safety structures, systems, and components (SSCs) that are relied upon to protect the safety and health of the off-site public as identified by safety analyses.

SAFETY PROGRAMS. Programs, required by DOE or other regulatory authority or committed to in the contractor's SMS description, that will be adhered to for a scope of work by a facility or site in support of the work.

SAFETY SIGNIFICANT STRUCTURES, SYSTEMS, AND COMPONENTS. Structures, systems, and components (SSCs) that are not designated as safety class SSCs, but whose preventive or mitigative function is a major contributor to defense in depth (i.e., prevention of uncontrolled material release) and/or worker safety as determined from hazard analyses.

SAFETY STRUCTURES, SYSTEMS AND COMPONENTS. Both safety significant SSCs and safety class SSCs.

SECRETARIAL OFFICER. The head of a first-tier organization; a DOE Headquarters employee reporting directly to the Secretary, the Under Secretary, or the Deputy Secretary.

STANDARD. A generic, all-encompassing term used to describe documents that provide a specified set of mandatory or discretionary rules, requirements, or conditions concerned with performance, design, operation, or measurements of quality to accomplish a specific task. Standards may include Federal laws, regulations, State laws, Federal agency directives, national and internal technical standards, codes of conduct, or even organizational “internal use only” documents.

SURVEILLANCE. Any periodic monitoring to ensure operability or adequacy of performance.

TAILORING. Adapting something, such as a safety program, practice, or requirement, within the ISMS to suit the need or purposes of a particular operation/activity, taking into account the type of work and associated hazards.

TECHNICAL SAFETY REQUIREMENTS (TSRs). Those requirements that define the conditions, safe boundaries, and management or administrative controls necessary to ensure the safe operation of a nuclear facility and to reduce the potential risk to the public and facility workers from uncontrolled releases of radioactive materials or from radiation exposures due to inadvertent criticality. TSRs consist of safety limits, operating limits, surveillance requirements, administrative controls, use and application instructions, and the basis thereof.

TECHNICAL STANDARD. A document that sets down a discretionary set of actions that must be accomplished to meet the purpose of the encompassing document. These actions are generally concerned with descriptions or steps that must be met to accomplish a specific task, such as classification of components, operation of equipment, enhancement of quality, or protection of personnel. They may also be used for procurement activities, such as specification of materials, products, or services in accordance with a specific set of conditions for delivery. Technical standards may only be made mandatory by direct reference in a requirements-type document, such as a contract, law, rule, or Federal agency directive.

UNREVIEWED SAFETY QUESTION (USQ).

- a. A USQ exists if one or more of the following conditions is identified:
 - (1) the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety as previously evaluated in the facility safety analyses could be increased;
 - (2) the possibility for an accident or malfunction of a different type than any evaluated previously in the facility safety analyses could be created; or
 - (3) any margin of safety as defined in the bases of the TSRs could be reduced.
- b. A USQ determination is made when one of the following circumstances occurs:
 - (1) temporary or permanent changes in the facility as described in existing safety analyses;
 - (2) temporary or permanent changes in the procedures as derived from existing safety analyses; and
 - (3) tests or experiments not described in existing safety analyses.

USQ PROCESS. A process to determine when DOE is to be involved in decision making involving a USQ.

VOLUNTARY PROTECTION PROGRAM. The Department of Energy Voluntary Protection Program (DOE-VPP), which promotes safety and health excellence through cooperative efforts among labor, management, and government at DOE contractor sites. DOE has also formed partnerships with other Federal agencies and the private sector for both advancing and sharing its VPP experiences and preparing for program challenges in the next century. The safety and health of contractor and federal employees are a high priority for the Department (see <http://tis-nt.eh.doe.gov/vpp/>).

WORK. Process of performing a defined task or activity; for example, research and development, operations, maintenance and repair, administration, software development and use, inspection, safeguards and security, data collection, and analysis.

WORK AUTHORIZATION. The process used by line management to permit a task or activity to be initiated as planned, having determined that it can be performed safely.

WORK FOR OTHERS. The performance of work for non-DOE entities by DOE/contractor personnel and/or the use of DOE facilities that is not directly funded by DOE appropriations.

WORK PERFORMANCE. The act of performing work.

WORK PLANNING. The process of planning a defined task or activity. Addressing safety as an integral part of work planning includes execution of the safety-related functions in preparation for performance of a scope of work. These functions include (1) definition of the scope of work; (2) formal analysis of the hazards bringing to bear in an integrated manner specialists in both ES&H and engineering, depending on specific hazards identified; (3) identification of resulting safety controls including safety structures, systems and components, and other safety-related commitments to address the hazards; and (4) approval of the safety controls.

CANCELED

APPENDIX B

RESOURCES FOR COMPLYING WITH THE SMS POLICIES, THE FRAM, AND THE DEAR

1. INTRODUCTION

This appendix is intended to be used as a resource for complying with 48 CFR Chapter 9 (DEAR) Part 970.5204-78, "Laws, Regulations, and DOE Directives," which standardizes the manner in which applicable requirements are included in Department of Energy (DOE) contracts. The appendix is developed as a resource tool rather than as a comprehensive list. DOE maintains a web site that allows access to current Department directives (<http://www.explorer.doe.gov:1776/htmls/directives.html>). To focus the selection and aid tailoring of standards, DOE has prepared many guides for particular safety activities (e.g., fire protection) that link to acceptable codes and industry standards. Many canceled or partially canceled DOE directives are included in this list because they may still be incorporated into a contract (see Section 2.8 of this appendix).

2. RESOURCES BY TOPICAL AREA

2.1 Define Scope of Work And Balanced Priorities

Federal Rules

- 48 CFR 970.1001 and 970.5204: Department of Energy Acquisition Regulations

DOE Policies, Notices, and Orders

- DOE P 450.4: DOE SAFETY MANAGEMENT SYSTEM POLICY
- DOE O 130.1: BUDGET FORMULATION PROCESS
- DOE O 135.1: BUDGET EXECUTION - FUNDS DISTRIBUTION AND CONTROL
- DOE O 137.1: PLAN FOR OPERATING IN THE EVENT OF A LAPSE IN APPROPRIATIONS
- DOE O 224.1: CONTRACTOR PERFORMANCE - BASED MANAGEMENT PROCESS
- DOE O 241.1: SCIENTIFIC AND TECHNICAL INFORMATION MANAGEMENT
- DOE O 251.1A: DIRECTIVES SYSTEM
- DOE P 251.1: DIRECTIVES SYSTEM
- DOE O 331.1: DEPARTMENTAL EMPLOYEE PERFORMANCE MANAGEMENT SYSTEM
- DOE O 350.1: CONTRACTOR HUMAN RESOURCE MANAGEMENT PROGRAMS
- DOE O 413.1: MANAGEMENT CONTROL PROGRAM

- DOE P 430.1: LAND AND FACILITY USE PLANNING
- DOE O 430.1A: LIFE-CYCLE ASSET MANAGEMENT
- DOE O 440.1A: WORKER PROTECTION MANAGEMENT FOR DOE FEDERAL AND CONTRACTOR EMPLOYEES
- DOE N 441.3: EXTENSION FOR DOE N 441.1, RADIOLOGICAL PROTECTION FOR DOE ACTIVITIES
- DOE P 450.6: ENVIRONMENT, SAFETY AND HEALTH
- DOE O 452.1A: NUCLEAR EXPLOSIVE AND WEAPON SURETY PROGRAM
- DOE O 460.2: DEPARTMENTAL MATERIALS TRANSPORTATION AND PACKAGING MANAGEMENT
- DOE O 470.1: SAFEGUARDS AND SECURITY PROGRAM
- DOE O 471.1: IDENTIFICATION AND PROTECTION OF UNCLASSIFIED CONTROLLED NUCLEAR INFORMATION
- DOE O 471.2A: INFORMATION SECURITY PROGRAM
- DOE O 472.1B: PERSONNEL SECURITY ACTIVITIES
- DOE O 541.1: APPOINTMENT OF CONTRACTING OFFICERS AND CONTRACTING OFFICER REPRESENTATIVES
- DOE O 542.1: COMPETITION IN CONTRACTING
- DOE 4300.1C: REAL PROPERTY MANAGEMENT
- DOE 4320.2A: CAPITAL ASSET MANAGEMENT PROCESS

DOE Guides and Technical Standards

- DOE-STD-1082-94: *Preparation, Review, and Approval of Implementation Plans for Nuclear Safety Requirements*
- DOE-DP-STD-3023-98: *Guidelines for Risk-Based Prioritization of DOE Activities*
- DOE/HR-0066: Total Quality Management Implementation Guidelines
- DOE/RW-0333P: Quality Assurance Requirements and Descriptions for the Civilian Radioactive Waste Management Program
- DOE G 120.1-5: GUIDELINES FOR PERFORMANCE MEASUREMENT
- DOE G 430.1-1: COST ESTIMATING GUIDE
- DOE G 440.1-1: WORKER PROTECTION MANAGEMENT FOR DOE FEDERAL AND CONTRACTOR EMPLOYEES GUIDE FOR USE WITH DOE O 440.1
- DOE G 440.1-2: CONSTRUCTION SAFETY MANAGEMENT GUIDE FOR USE WITH DOE O 440.1
- DOE G 440.1-4: CONTRACTOR OCCUPATIONAL MEDICAL PROGRAM GUIDE FOR USE WITH DOE O 440.1
- DOE G 440.1-6: IMPLEMENTATION GUIDE FOR USE WITH SUSPECT/COUNTERFEIT ITEMS REQUIREMENTS FOR DOE O 440.1, WORKER PROTECTION MANAGEMENT; 10 CFR 830.120, AND DOE 5700.6C, QUALITY ASSURANCE

- DOE G 450.3-3: TAILORING FOR INTEGRATED SAFETY MANAGEMENT APPLICATIONS
- DOE G 460.2-1: IMPLEMENTATION GUIDE FOR USE WITH DOE O 460.2, DEPARTMENT MATERIALS TRANSPORTATION AND PACKAGING MANAGEMENT

DOE Manuals and Handbooks

- DOE M 135.1-1: BUDGET EXECUTION MANUAL
- DOE M 251.1A: DIRECTIVES SYSTEM MANUAL
- DOE M 411.1-1: MANUAL OF SAFETY MANAGEMENT FUNCTIONS, RESPONSIBILITIES AND AUTHORITIES (FRAM)
- DOE M 471.2-1B: MANUAL FOR CLASSIFIED MATTER PROTECTION & CONTROL

Defense Nuclear Facilities Safety Board Technical Reports

- DNFSB/TECH-5, *Fundamentals for Understanding Standards-Based Safety Management of Department of Energy Defense Nuclear Facilities*
- DNFSB/TECH-6, *Safety Management and Conduct of Operations at the Department of Energy's Defense Nuclear Facilities*
- DNFSB/TECH-16, *Integrated Safety Management*

2.2 Analyze Hazards

Federal Rules

- 10 CFR 830: Nuclear Safety Management
- 10 CFR 835: Radiation Protection for Occupational Workers
- 10 CFR 1021: (DOE) National Environmental Policy Act Implementing Procedures
- 29 CFR 1910: Occupational Safety and Health Standards
- 29 CFR 1926: Occupational Safety and Health Regulations for Construction
- 40 CFR 50 to 195: EPA Air, Water and Radiation Protection Requirements
- 40 CFR 61 and 761 Toxic Substances Control Act Requirements
- 40 CFR 240 to 280 Resource Conservation and Recovery Act Requirements
- 40 CFR 300 to 306 Comprehensive Environmental Response, Compensation and Liabilities Act Requirements
- 40 CFR 1500 to 1508 National Environmental Policy Act Requirements

DOE Policies, Notices, and Orders

- DOE P 410.1A: DEVELOPING NUCLEAR SAFETY REQUIREMENTS
- DOE O 420.1: FACILITY SAFETY

- DOE O 420.2: SAFETY OF ACCELERATOR FACILITIES
- DOE O 430.1A: LIFE CYCLE ASSET MANAGEMENT
- DOE O 440.1: WORKER PROTECTION MANAGEMENT FOR DOE FEDERAL AND CONTRACTOR EMPLOYEES
- DOE O 440.2: AVIATION
- DOE O 452.1A: NUCLEAR EXPLOSIVE AND WEAPONS SURETY PROGRAM
- DOE O 452.2A: SAFETY OF NUCLEAR EXPLOSIVE OPERATIONS
- DOE O 452.4: SECURITY AND CONTROL OF NUCLEAR EXPLOSIVES AND NUCLEAR WEAPONS
- DOE O 460.1A: PACKAGING AND TRANSPORTATION SAFETY
- DOE 5480.23: NUCLEAR SAFETY ANALYSIS REPORTS
- DOE 5480.30: NUCLEAR REACTOR SAFETY DESIGN CRITERIA

DOE Guides and Technical Standards

- DOE-STD-1021-93: *Natural Phenomena Hazards Performance Categorization Guidelines for Structures, Systems, and Components*
- DOE-STD-1022-94: *Natural Phenomena Hazards Site Characterization Criteria*
- DOE-STD-1023-95: *Natural Phenomena Hazards Assessment Criteria* (including Change Notice 1; January 1996)
- DOE-STD-1027-92: *Guidance on Preliminary Hazard Classification and Accident Analysis*
- DOE-STD-1088-95: *Fire Protection for Relocatable Structures*
- DOE-STD-1101-96: *Process Safety Management for Highly Hazardous Chemicals*
- DOE-STD-1104-96: *Review and Approval of Nonreactor Nuclear Facility Safety Analysis Reports*
- DOE-STD-1120-98: *Integration of Safety and Health into Facility Disposition Activities*
- DOE-STD-3007-93: *Guidelines for Preparing Criticality Safety Evaluations at Department of Energy Non-Reactor Nuclear Facilities*
- DOE-STD-3009-94: *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Safety Analysis Reports*
- DOE-STD-3014-96: *Accident Analysis for Aircraft Crash into Hazardous Facilities*
- DOE-STD-3015-97: *Nuclear Explosive Safety Study Process*
- DOE-STD-6002-96: *Safety of Magnetic Fusion Facilities: Requirements*
- DOE-STD-6003-96: *Safety of Magnetic Fusion Facilities: Guidance*
- DOE-DP-STD-3016-99: *Hazard Analysis Reports for Nuclear Explosive Operations*
- DOE-EM-5502-94: *Hazard Baseline Documentation*
- DOE-EM-5503-94: *EM Health and Safety Plan Guidelines*
- DRAFT DOE G 420.1-X: IMPLEMENTATION GUIDE FOR NONREACTOR NUCLEAR SAFETY DESIGN CRITERIA AND EXPLOSIVES SAFETY CRITERIA

- DRAFT DOE G 420.1-Y: IMPLEMENTATION GUIDE FOR THE MITIGATION OF NATURAL PHENOMENA HAZARDS FOR DOE NUCLEAR FACILITIES AND NON-NUCLEAR FACILITIES
- DOE G 450.3-1: DOCUMENTATION FOR WORK SMART STANDARDS APPLICATIONS: CHARACTERISTICS AND CONSIDERATIONS
- DOE G 450.3-2: ATTRIBUTES OF EFFECTIVE IMPLEMENTATION
- DOE G 450.3-3: TAILORING FOR INTEGRATED SAFETY MANAGEMENT APPLICATIONS
- DOE G 450.3-5: CRITERIA FOR THE DEPARTMENT'S STANDARDS PROGRAM
- DOE G 452.2A-1A: IMPLEMENTATION GUIDE FOR DOE ORDER 452.2A SAFETY OF NUCLEAR EXPLOSIVE OPERATIONS
- DOE G 460.1-1: IMPLEMENTATION GUIDE FOR USE WITH DOE O 460.1A, PACKAGING AND TRANSPORTATION SAFETY

DOE Manuals and Handbooks

- DOE M 440.1-1: DOE EXPLOSIVES SAFETY MANUAL
- DOE-HDBK-1100-96: Chemical Process Hazards Analysis
- DOE-HDBK-1101-96: *Process Safety Management for Highly Hazardous Chemicals*
- DOE-HDBK-3010-94: *Airborne Release Fractions/Rates and Respirable Fractions for Nonreactor Nuclear Facilities*, Vols. I & II
- DOE-DP-HDBK-XXXX: Draft HAR Handbooks for Pantex and Nevada

Non-DOE Documents

- *Guidelines for Hazard Evaluation Procedures, Second Edition with Worked Examples*, Center for Chemical Process Safety, AIChE, 1992
- *Risk Assessment and Risk Management for the Chemical Process Industry*, Stone and Webster Engineering Corporation, 1991
- *Management of Process Hazards*, American Petroleum Institute Recommended Practice 750, 1990
- System Safety Society, *System Safety Analysis Handbook: A Source Book for Safety Practitioners*, 1993.
- OSHA, 1981, *Job Hazard Analysis: A Tool to a Safer, More Healthful Workplace*, 1981.
- NUREG-0492, *Fault Tree Handbook*, U.S. Nuclear Regulatory Commission, January 1981.
- OSHA 3071, 1988 (reprint), *Job Hazard Analysis*, Occupational Safety and Health Administration, U.S. Department of Labor,
- DNFSB/TECH-5, *Fundamentals for Understanding Standards-Based Safety Management of Department of Energy Defense Nuclear Facilities*
- DNFSB/TECH-6, *Safety Management and Conduct of Operations at the Department of Energy's Defense Nuclear Facilities*
- DNFSB/TECH-16, *Integrated Safety Management*

2.3 Develop/Implement Hazards Controls, Identification of Safety Standards and Requirements; and Hazard Controls Tailored to Work Being Performed

Federal Rules

- 10 CFR 708: DOE Contractor Employee Protection Program
- 10 CFR 830: Nuclear Safety Management
- 10 CFR 834: Radiation Protection of the Public and the Environment (Draft)
- 10 CFR 835: Radiation Protection for Occupational Workers
- 10 CFR 1021: (DOE) National Environmental Policy Act Implementing Procedures
- 29 CFR 1910: Occupational Safety and Health Standards
- 29 CFR 1912: Occupational Safety and Health Standards: Process Safety Management
- 29 CFR 1926: Occupational Safety and Health Regulations for Construction
- 40 CFR 50 to 195: EPA Air, Water and Radiation Protection Requirements
- 40 CFR 61 and 761 Toxic Substances Control Act Requirements
- 40 CFR 68: EPA Chemical Risk Management Program
- 40 CFR 240 to 280 Resource Conservation and Recovery Act Requirements
- 40 CFR 300 to 306 Comprehensive Environmental Response, Compensation and Liabilities Act Requirements
- 40 CFR 1500 to 1508 National Environmental Policy Act Requirements

DOE Policies, Notices, and Orders

- DOE O 360.1: TRAINING
- DOE O 420.1: FACILITY SAFETY
- DOE O 420.2: SAFETY OF ACCELERATOR FACILITIES
- DOE O 440.1: WORKER PROTECTION MANAGEMENT FOR DOE FEDERAL AND CONTRACTOR EMPLOYEES
- DOE N 440.1: INTERIM CHRONIC BERYLLIUM DISEASE PREVENTION PROGRAM
- DOE N 441.1: RADIOLOGICAL PROTECTION FOR DOE ACTIVITIES
- DOE P 441.1: DEPARTMENT OF ENERGY RADIOLOGICAL HEALTH AND SAFETY POLICY
- DOE N 441.4: EXTENSION OF DOE N 441.1, RADIOLOGICAL PROTECTION FOR DOE ACTIVITIES
- DOE P 450.1: ENVIRONMENT, SAFETY, AND HEALTH POLICY FOR THE DEPARTMENT OF ENERGY COMPLEX
- DOE P 450.2A: IDENTIFICATION, IMPLEMENTATION, AND COMPLIANCE WITH ENVIRONMENT, SAFETY AND HEALTH REQUIREMENTS
- DOE P 450.3: AUTHORIZING USE OF THE NECESSARY AND SUFFICIENT PROCESS FOR STANDARDS-BASED ENVIRONMENT, SAFETY AND HEALTH MANAGEMENT

- DOE P 450.4: SAFETY MANAGEMENT SYSTEM POLICY
- DOE P 450.5: LINE ENVIRONMENT, SAFETY AND HEALTH
- DOE P 450.6: ENVIRONMENT, SAFETY AND HEALTH
- DOE O 451.1A: NATIONAL ENVIRONMENTAL POLICY ACT COMPLIANCE PROGRAM
- DOE O 452.4: SECURITY AND CONTROL OF NUCLEAR EXPLOSIVES AND NUCLEAR WEAPONS
- DOE O 460.1A: PACKAGING AND TRANSPORTATION SAFETY
- DOE O 460.2: DEPARTMENTAL MATERIALS TRANSPORTATION AND PACKAGING MANAGEMENT
- DOE O 470.1: SAFEGUARDS AND SECURITY PROGRAM
- DOE O 471.1: IDENTIFICATION AND PROTECTION OF UNCLASSIFIED CONTROLLED NUCLEAR INFORMATION
- DOE O 471.2A: INFORMATION SECURITY PROGRAM
- DOE O 472.1B: PERSONNEL SECURITY ACTIVITIES
- DOE 4330.4B: MAINTENANCE MANAGEMENT PROGRAM
- DOE 5480.20A: PERSONNEL SELECTION, QUALIFICATION, AND TRAINING REQUIREMENTS FOR DOE NUCLEAR FACILITIES
- DOE 5480.21: UNREVIEWED SAFETY QUESTIONS
- DOE 5480.22: TECHNICAL SAFETY REQUIREMENTS
- DOE 5480.23: NUCLEAR SAFETY ANALYSIS REPORTS
- DOE 5530.1A: ACCIDENT RESPONSE GROUP
- DOE 5530.2: NUCLEAR EMERGENCY SEARCH TEAM
- DOE 5530.3: RADIOLOGICAL ASSISTANCE PROGRAM
- DOE 5530.4: AERIAL MEASURING SYSTEM
- DOE 5610.13: JOINT DEPARTMENT OF ENERGY/DEPARTMENT OF DEFENSE NUCLEAR WEAPON SAFETY, SECURITY, AND CONTROL ACTIVITIES
- DOE 5820.2A: RADIOACTIVE WASTE MANAGEMENT

DOE Guides and Technical Standards

- DOE-STD-1023-95: *Natural Phenomena Hazards Assessment Criteria* (including Change No. 1; January 1996)
- DOE-STD-1027-92: *Guidance on Preliminary Hazard Classification and Accident Analysis Techniques for Compliance with DOE 5480.23 NUCLEAR SAFETY ANALYSIS REPORTS* (above)
- DOE-STD-1029-92: *Writer's Guide for Technical Procedures*
- DOE-STD-1030-92: *Guide to Good Practices for Lockouts and Tagouts*
- DOE-STD-1040-93: *Guide to Good Practices for Control of On-Shift Training*
- DOE-STD-1053-93: *Guideline to Good Practices for Control of Maintenance Activities at DOE Nuclear Facilities*
- DOE-STD-1066-97: *Fire Protection Design Criteria*

- DOE-STD-1070-94: *Guidelines for Evaluation of Nuclear Facility Training Programs*
- DOE-STD-1073-93: *Guide for Operational Configuration Management Program*
- DOE-STD-1077-94: *Training Accreditation Program Standard: Requirements and Guidelines*
- DOE-STD-1082-94: *Preparation, Review, and Approval of Implementation Plans for Nuclear Safety Requirements*
- DOE-STD-1083-95: *Requesting and Granting Exemptions to Nuclear Safety Rules*
- DOE-STD-1088-95: *Fire Protection for Relocatable Structures*
- DOE-STD-1120-98: *Integration of Safety and Health into Facility Disposition Activities*
- DOE-STD-1128-98: *Guide of Good Practices for Occupational Radiological Protection in Plutonium Facilities*
- DOE-STD-3007-93: *Guidelines for Preparing Criticality Safety Evaluations at DOE Non-Reactor Nuclear Facilities*
- DOE-STD-3009-94: *Prep. Guide for U.S. DOE Nonreactor Nuclear Facility Safety Analysis Reports*
- DOE-STD-3011-94: *Guidance for Preparation of DOE 5480.22 TECHNICAL SAFETY REQUIREMENTS (TSR) and DOE 5480.23 NUCLEAR SAFETY ANALYSIS REPORTS (SAR) Implementation Plans*
- DOE-STD-3020-97: *Specification for HEPA Filters Used by DOE Contractors (revision to DOE NE F3-45)*
- DOE-STD-3022-98: *DOE HEPA Filter Test Program*
- DP-STD-0135-98: *(DOE) Model Pollution Opportunity Assessment Guidance*
- EH-STD-0256T: *Radiological Control Manual*
- EH-STD-0365-94: *A Comparison of the RCRA Corrective Action and CERCLA Remedial Action Processes*
- EH-STD-0427-94: *Guide to Selecting Compliant Off-Site Hazardous Waste Treatment, Storage and Disposal Facilities*
- EH-STD-0416: *Criteria for the Department's Standards Program*
- EH-STD-0433: *DOE Voluntary Protection Program, Part I: Program Elements*
- EH-STD-0433: *DOE Voluntary Protection Program, Part II: Procedures Manual*
- EH-STD-0433: *DOE Voluntary Protection Program, Part III: Application Guidelines*
- EH-STD-0433: *DOE Voluntary Protection Program, Part IV: On-site Review Handbook*
- EH-STD-0435-95: *Removal Actions under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)*
- EH-STD-0486: *Integrating Safety and Health During Deactivation, With Lessons Learned from Purex*
- EH-STD-0506-95: *Phased Response/Early Actions*
- EH-STD-0535: *Handbook for Occupational Health and Safety During Hazardous Waste Activities*
- EH-STD-0536: *Management Perspectives on Worker Protection During DOE Hazardous Waste Activities*
- EH-STD-0573: *Environmental Management System Primer for Federal Facilities*

- EH-STD-0580: *Integrated Safety Management Activity-Level Work Control Tools Index*
- EM-STD-5502-94: *Hazard Baseline Documentation*
- EM-STD-5503-94: *EM Health and Safety Plan Guidelines*
- TSL-1-97: *DOE Technical Standards List*
- DOE-76-45-19: *Job Safety Analysis*, 1979
- DOE-76-45: *Barrier Analysis*, 1985
- DOE G 151.1-1: EMERGENCY MANAGEMENT GUIDE
- DOE G 414.1-1: IMPLEMENTATION GUIDE FOR USE WITH INDEPENDENT AND MANAGEMENT ASSESSMENT REQUIREMENTS OF 10 CFR PART 830.120 AND DOE 5700.6C, QUALITY ASSURANCE
- DRAFT DOE G 430.1-2: SURVEILLANCE AND MAINTENANCE DURING FACILITY DISPOSITION
- DRAFT DOE G 430.1-3: DEACTIVATION IMPLEMENTATION GUIDE
- DRAFT DOE G 430.1-4: DECOMMISSIONING IMPLEMENTATION GUIDE
- DOE G 440.1-1: WORKER PROTECTION MANAGEMENT FOR DOE FEDERAL AND CONTRACTOR EMPLOYEES GUIDE FOR USE WITH DOE O 440.1
- DOE G 440.1-2: CONSTRUCTION SAFETY MANAGEMENT GUIDE
- DOE G 440.1-4: CONTRACTOR OCCUPATIONAL MEDICAL PROGRAM GUIDE FOR USE WITH DOE O 440.1
- DOE G 440.1-5: IMPLEMENTATION GUIDE FOR FIRE SAFETY PROGRAM
- DOE G 440.1-6: IMPLEMENTATION GUIDE FOR USE WITH SUSPECT/COUNTERFEIT ITEMS REQUIREMENTS OF DOE O 440.1, WORKER PROTECTION MANAGEMENT; 10 CFR 830.120; AND DOE 5700.6C, QUALITY ASSURANCE
- DOE G 440.1-7: IMPLEMENTATION GUIDE FOR USE WITH DOE N 440.1, INTERIM CHRONIC BERYLLIUM DISEASE PREVENTION PROGRAM
- DOE G 450.3-3: TAILORING FOR INTEGRATED SAFETY MANAGEMENT APPLICATIONS
- DOE G 450.3-5: CRITERIA FOR THE DEPARTMENT'S STANDARDS PROGRAM
- DOE G 460.1-1: IMPLEMENTATION GUIDE FOR USE WITH DOE O 460.1A, PACKAGING AND TRANSPORTATION SAFETY
- DOE G 10 CFR 835: Implementation Guide for Use with Title 10, Code of Federal Regulations, Part 835, Occupational Radiation Protection.

DOE Manuals and Handbooks

- DOE M 450.3-1: THE DEPARTMENT OF ENERGY CLOSURE PROCESS FOR NECESSARY AND SUFFICIENT SETS OF STANDARDS
- DOE M 471.2-1: CLASSIFIED MATTER PROTECTION & CONTROL MANUAL
- DOE-HDBK-1078-94: *Training Program Handbook: A Systematic Approach to Training*
- DOE-HDBK-1079-94: *Primer for Tritium Safe Handling Practices*
- DOE-HDBK 1100-96: *Chemical Process Hazards Analysis*

- DOE-HDBK 1101-96: *Process Safety Management for Highly Hazardous Chemicals*
- DOE-HDBK 1105-96: *Radiological Training for Tritium Facilities*
- DOE-HDBK 1106-97: *Radiological Contamination Control Training for Laboratory Research*
- DOE-HDBK 1107-97: *Knowledge, Skills, and Abilities for Key Radiation Protection Positions at DOE Facilities*

DOE Documents

- Department Report, *Standards/Requirements Identification Document Development and Approval Instruction*, September 1994
- Department Report, *Standards/Requirements Implementation Assessment Instruction*, September 1994

Non-DOE Documents

- CMA-15M, *Responsible Care in Action: 1993-1994 Progress Report*, October 1994
- EPA 300R-94-009, *Environmental Management System Benchmark Report: A Review of Federal Agencies and Selected Private Companies*, December 1994.
- EPA 315-B-97-001, *Implementation Guide for the Code of Environmental Management Principles for Federal Agencies*, March 1997.
- *Management of Process Hazards*, American Petroleum Institute Recommended Practice 750, 1990
- ISO/FDIS 2919: *Radiation protection—Sealed radioactive sources—General requirements and classification*
- ISO 8194:1987, *Radiation protection—Clothing for protection against radioactive contamination—Design, selection, testing and use*
- ISO 14001:1996, *Environmental management systems—Specification with guidance for use*
- ISO 14004:1996, *Environmental management systems—General guidelines on principles, systems, and supporting techniques*
- DNFSB/TECH-5, *Fundamentals for Understanding Standards-Based Safety Management of Department of Energy Defense Nuclear Facilities*
- DNFSB/TECH-6, *Safety Management and Conduct of Operations at the Department of Energy's Defense Nuclear Facilities*
- DNFSB/TECH-15, *Operational Formality for Department of Energy Nuclear Facilities and Activities: An Evaluation Guide*
- DNFSB/TECH-16, *Integrated Safety Management*
- OSHA 3071, *Job Hazard Analyses*, 1998,R

2.4 Perform Work and Operations Authorization

Federal Rules

- 10 CFR 71: PACKAGING AND TRANSPORTATION

DOE Policies, Notices, and Orders

- DOE O 151.1: COMPREHENSIVE EMERGENCY MANAGEMENT SYSTEM
- DOE O 425.1A: STARTUP AND RESTART OF NUCLEAR FACILITIES
- DOE O 440.1A: WORKER PROTECTION MANAGEMENT FOR DOE FEDERAL AND CONTRACTOR EMPLOYEES
- DOE O 451.1A: NATIONAL ENVIRONMENTAL POLICY ACT COMPLIANCE PROGRAM
- DOE O 452.2A: SAFETY OF NUCLEAR EXPLOSIVE OPERATIONS
- DOE 4330.4B: MAINTENANCE MANAGEMENT PROGRAM
- DOE 5480.19: CONDUCT OF OPERATIONS REQUIREMENTS FOR DOE FACILITIES
- DOE 5480.20A: PERSONNEL SELECTION, QUALIFICATION, AND TRAINING REQUIREMENTS FOR DOE NUCLEAR FACILITIES
- DOE 5480.22: TECHNICAL SAFETY REQUIREMENTS
- DOE 5530.1A: ACCIDENT RESPONSE GROUP
- DOE 5530.2: NUCLEAR EMERGENCY SEARCH TEAM
- DOE 5530.3: RADIOLOGICAL ASSISTANCE PROGRAM
- DOE 5530.4: AERIAL MEASURING SYSTEM

DOE Guides and Technical Standards

- DOE-STD-1029-92: *Writer's Guide for Technical Procedures*
- DOE-STD-1030-92: *Guide to Good Practices for Lockouts and Tagouts*
- DOE-STD-1032-92: *Guide to Good Practices for Operations Organization and Administration*
- DOE-STD-1037-93: *Guide to Good Practices for Operations Aspects of Unique Processes*
- DOE-STD-1039-93: *Guide to Good Practices for Control of Equipment and System Status*
- DOE-STD-1040-93: *Guide to Good Practices for Control of On-Shift Training*
- DOE-STD-1041-93: *Guide to Good Practices for Shift Routines and Operating Practices*
- DOE-STD-1050-93: *Guideline to Good Practices for Planning, Scheduling, and Coordination of Maintenance at DOE Nuclear Facilities*
- DOE-STD-1051-93: *Guideline to Good Practices for Maintenance Organization and Administration at DOE Nuclear Facilities*
- DOE-STD-1052-93: *Guideline to Good Practices for Types of Maintenance Activities at DOE Nuclear Facilities*
- DOE-STD-1053-93: *Guideline to Good Practices for Control of Maintenance Activities at DOE Nuclear Facilities*

- DOE-STD-1055-93: *Guideline to Good Practices for Maintenance Management Involvement at DOE Nuclear Facilities*
- DOE-STD-1056-93: *Guide to Good Practices for Line and Training Manager Activities Related to Training and Qualification*
- DOE-STD-1057-93: *Guide to Good Practices for the Selection, Training, and Qualification of Shift Technical Advisors, February 1993*
- DOE-STD-1059-93: *Guide To Good Practices for maintenance Supervisor Selection and Development, February 1993*
- DOE-STD-1060-93: *Guide to Good Practices for Continuing Training, February 1993*
- DOE-STD-1061-93: *Guide to Good Practices for the Selection, Training, and Qualification of Shift Supervisors, February 1993*
- DOE-STD-1065-94: *Guideline to Good Practices for Postmaintenance Testing at DOE Nuclear Facilities*
- DOE-STD-1070-94: *Guidelines for Evaluation of Nuclear Facility Training Programs*
- DOE-STD-1077-94: *Training Accreditation Program Standard: Requirements and Guidelines*
- DOE-STD-1107-97: *Knowledge, Skills, and Abilities for key Radiation Protection Positions at DOE facilities*
- DOE-STD-3006-95: *Planning and Conduct of Operational Readiness Reviews*
- DOE-STD-3012-96: *Guide to Good Practices for Operational Readiness Reviews*
- EH-STD-0256T: *Radiological Control Manual*
- EH-STD-0580: *Integrated Safety Management Activity-Level Work Control Tools Index*
- DOE G 120.1-5: **GUIDELINES FOR PERFORMANCE MEASUREMENT**
- DRAFT DOE G 430.1-2: **SURVEILLANCE AND MAINTENANCE DURING FACILITY DISPOSITION**
- DOE G 440.1-1: **WORKER PROTECTION MANAGEMENT FOR DOE FEDERAL AND CONTRACTOR EMPLOYEES GUIDE FOR USE WITH DOE O 440.1**
- DOE G 440.1-2: **CONSTRUCTION SAFETY MANAGEMENT GUIDE**
- DOE G 440.1-4: **CONTRACTOR OCCUPATIONAL MEDICAL PROGRAM GUIDE FOR USE WITH DOE O 440.1**
- DOE G 440.1-5: **IMPLEMENTATION GUIDE FOR FIRE SAFETY PROGRAM**

DOE Manuals and Handbooks

- DOE-HDBK-1001-96: *Guide to Good Practices for Training and Qualification of Instructors, March 1996 (replaces DOE-NE-STD-1001-91)*
- DOE-HDBK-1002-96: *Guide to Good Practices for Training and Qualification of Chemical Operators, March 1996 (replaces DOE-NE-STD-1002-91)*
- DOE-HDBK-1003-96: *Guide to Good Practices for Training and Qualification of Maintenance Personnel, March 1996 (replaces DOE-NE-1003-91)*
- DOE-HDBK-1074-95: *Alternative Systematic Approaches to Training, January 1995*
- DOE-HDBK-1076-94: *Table-Top Job Analysis, December 1994*

- DOE-HDBK-1078-94: *Training Program Handbook: A Systematic Approach to Training*
- DOE-HDBK-1079-94: *Primer for Tritium Safe Handling Practices*
- DOE-HDBK-1080-97: *Guide to Good Practices for Oral Examinations*
- DOE-HDBK-1081-94: *Primer on Spontaneous Heating and Pyrophoricity, September 1994*
- DOE-HDBK-1084-95: *Primer on Lead-Acid Storage Batteries, September 1995*
- DOE-HDBK-1086-95: *Table-Top Training Program Design, April 1995*
- DOE-HDBK-1099-96: *Establishing Nuclear Facility Drill Programs, October 1995*
- DOE-HDBK-1103-96: *Guide to Good Practices for Training and Qualification of Maintenance Personnel, March 1996 (replaces DOE-NE-1003-91)*
- DOE-HDBK-1105-96: *Radiological Training for Tritium Facilities*
- DOE-HDBK-1106-97: *Radiological Contamination Control Training for Laboratory Research*
- DOE-HDBK-1108-97: *Radiological Safety Training for Accelerator Facilities*
- DOE-HDBK-1109-97: *Radiological Safety Training for Radiation Producing (X-Ray) Devices*
- DOE-HDBK-1110-97: *ALARA Training for Technical Support Personnel*
- DOE-HDBK-1113-98: *Radiological Safety Training for Uranium Facilities*
- DOE-HDBK-1114-98: *Guide to Good Practices for Line and Training Manager Activities*
- DOE-HDBK-1116-98: *Guide to Good Practices for Developing and Conducting Case*
- DOE-HDBK-1200-97: *Guide to Good Practices for Developing Learning Objectives (supersedes DOE-STD-1005-92)*
- DOE-HDBK-1201-97: *Guide to Good Practices: Evaluation Instrument Examples (replaces DOE-STD-1006-92)*
- DOE-HDBK-1202-97: *Guide to Good Practices for Teamwork Training and Diagnostic Skills Development (replaces DOE-STD-1007-92)*
- DOE-HDBK-1203-97: *Guide to Good Practices for Training of Technical Staff and Managers (replaces DOE-STD-1008-92)*
- DOE-HDBK-1204-97: *Guide to Good Practices for Development of Test (replaces DOE-STD-1009-92)*
- DOE-HDBK-1205-97: *Guide to Good Practices for the Design, Development, and Implementation of Examinations (replaces DOE-STD-1011-92)*
- DOE-HDBK-1206-98: *Guide to Good practices for On-the-Job Training*
- DOE-HDBK-3012-96: *Guide to Good Practices for Operational Readiness Reviews (ORR), Team Leader's Guide*
- DOE-HDBK-5504-95: *Guidance for Evaluation of Operational Emergency Plans*

Non-DOE Documents

- DNFSB/TECH-5, *Fundamentals for Understanding Standards-Based Safety Management of Department of Energy Defense Nuclear Facilities*
- DNFSB/TECH-6, *Safety Management and Conduct of Operations at the Department of Energy's Defense Nuclear Facilities*

- DNFSB/TECH-15, *Operational Formality for Department Of Energy Nuclear Facilities and Activities: An Evaluation Guide*
- DNFSB/TECH-16, *Integrated Safety Management*
- DNFSB/TECH-19, *Authorization Agreements for Defense Nuclear Facilities and Activities*

2.5 Feedback/Improvement

DOE Policies, Notices, and Orders

- DOE O 210.1: PERFORMANCE INDICATORS AND ANALYSIS OF OPERATIONS INFORMATION
- DOE O 225.1A: ACCIDENT INVESTIGATIONS
- DOE O 231.1: ENVIRONMENT, SAFETY, AND HEALTH REPORTING
- DOE O 232.1A: OCCURRENCE REPORTING AND PROCESSING OF OPERATIONS INFORMATION
- DOE O 413.1: MANAGEMENT CONTROL PROGRAM
- DOE O 414.1: QUALITY ASSURANCE
- DOE O 442.1: DEPARTMENT OF ENERGY EMPLOYEE CONCERNS PROGRAM
- DOE P 450.5: LINE ENVIRONMENT, SAFETY AND HEALTH
- DOE O 470.2: SAFEGUARDS AND SECURITY INDEPENDENT OVERSIGHT PROGRAM
- DOE 5484.1: ENVIRONMENTAL PROTECTION, SAFETY AND HEALTH PROTECTION INFORMATION REPORTING REQUIREMENTS

DOE Guides and Technical Standards

- DOE-STD-1036-93: *Guide to Good Practices for Independent Verification*
- DOE-STD-1055-93: *Guideline to Good Practices for Maintenance Management Involvement at DOE Nuclear Facilities*
- DOE-STD-1063-93: *Establishing and Maintaining a Facility Representative Program at DOE Nuclear Facilities*
- DOE-STD-1065-94: *Guideline to Good Practice for Postmaintenance Testing at DOE Nuclear Facilities*
- DOE-STD-1070-94: *Guidelines for Evaluation of Nuclear Facility Training Programs*
- DOE-STD-1077-94: *Training Accreditation Program Standard: Requirements and Guidelines*
- DOE-STD-7501-95: *Development of DOE Lessons Learned Programs*
- EH-STD-0001-94: *RCRA Corrective Action and CERCLA Remedial Action Reference Guide*
- EH-STD-0441-95: *Reporting Continuous Releases of Hazardous and Extremely Hazardous Substances under CERCLA and EPCRA*
- EM-STD- 5505-96: *Operations Assessments*
- DOE G 120.1-5: GUIDELINES FOR PERFORMANCE MEASUREMENT

- DOE G 225.1A-1: IMPLEMENTATION GUIDE FOR USE WITH DOE O 225.1A, ACCIDENT INVESTIGATIONS
- DOE G 414.1-1: IMPLEMENTATION GUIDE FOR USE WITH INDEPENDENT AND MANAGEMENT ASSESSMENT REQUIREMENTS OF 10 CFR PART 830.120 AND DOE 5700.6C, QUALITY ASSURANCE
- DOE G 440.1-3: IMPLEMENTATION GUIDE FOR USE WITH DOE O.440.1 OCCUPATIONAL EXPOSURE ASSESSMENT
- DOE G 440.1-6: IMPLEMENTATION GUIDE *FOR USE WITH* SUSPECT/COUNTERFEIT ITEMS REQUIREMENTS OF DOE O 440.1, WORKER PROTECTION MANAGEMENT; 10 CFR 830.120; AND DOE 5700.6C, QUALITY ASSURANCE
- DOE G 442-1-1: DEPARTMENT OF ENERGY EMPLOYEE CONCERNS PROGRAM
- DOE G 450.3-4: ASSESSMENT

DOE Manuals and Handbooks

- DOE M 140.1-1A: INTERFACE WITH THE DEFENSE NUCLEAR FACILITIES SAFETY BOARD
- DOE M 231.1-1: ENVIRONMENT, SAFETY AND HEALTH REPORTING MANUAL
- DOE M 232.1-1A: OCCURRENCE REPORTING AND PROCESSING OF OPERATIONS INFORMATION
- DOE M 473.2-1 Chg. 1: FIREARMS QUALIFICATION COURSES MANUAL
- DOE M 474.1-2 Ch 1, Chg 2: NUCLEAR MATERIALS MANAGEMENT AND SAFEGUARDS SYSTEM REPORTING AND DATA SUBMISSION
- DOE-HDBK-1085-95: *DOE Enforcement Program Roles and Responsibilities*
- DOE-HDBK-1089-95: *Guidance for Identifying, Reporting, and Tracking Nuclear Safety Noncompliances*
- DOE-HDBK-1205-97: Guide to Good Practices for the Design, Development, and Implementation of Examinations (replaces DOE-STD-1011-92)
- DOE-HDBK-5504-95: *Guidance for Evaluation of Operational Emergency Plans*
- DOE-HDBK-7502-95: *Implementing U.S. Department of Energy Lessons Learned Programs*
- DOE and contractor management self-assessment requirements
- DOE-SAFT-0065-97: *Draft Integrated Safety Management System Verification (ISMSV) Process, Team Leader's Handbook*

Other Documents

- DOE and contractor management self-assessment requirements, including—
 - Health and Safety Audit Report guidance
 - Industrial Hygiene Report guidance
 - Radiological Protection Audit Report guidance
 - Quality Assurance Audit Report guidance

- Specific details from the contract being administered by DOE
 - Specific Site/Facility/Process/Activity Assessment and programs
 - Oversight Programs, such as Occurrence Reporting, Facility Representative, Corrective Action, and Quality Assurance Programs.
- DNFSB/TECH-5, *Fundamentals for Understanding Standards-Based Safety Management of Department of Energy Defense Nuclear Facilities*
 - DNFSB/TECH-6, *Safety Management and Conduct of Operations at the Department of Energy's Defense Nuclear Facilities*
 - DNFSB/TECH-16, *Integrated Safety Management*

2.6 Line Management Responsibility for Safety and Clear Roles and Responsibilities

References

- 10 CFR 820: PROCEDURAL RULES FOR DOE NUCLEAR ACTIVITIES
- DOE M 411.1-1: MANUAL OF SAFETY MANAGEMENT FUNCTIONS, RESPONSIBILITIES AND AUTHORITIES (FRAM)
- DOE P 411.1: SAFETY MANAGEMENT FUNCTIONS, RESPONSIBILITIES, AND AUTHORITIES POLICY

2.7 Competence Commensurate with Responsibility

References

- Federal Acquisition Regulation 15.605
- 41 U.S.C. 253a
- 10 CFR 830: Nuclear Safety Management
- DOE O 360.1: TRAINING
- DOE O 414.1: QUALITY ASSURANCE
- DOE P 426.1: FEDERAL TECHNICAL CAPABILITY POLICY FOR DEFENSE NUCLEAR FACILITIES
- DOE G 426.1-1: RECRUITING, HIRING, AND RETAINING HIGH QUALITY TECHNICAL STAFF
- DOE O 440.1: WORKER PROTECTION MANAGEMENT FOR DOE FEDERAL AND CONTRACTOR EMPLOYEES
- DOE G 450.3-4: ASSESSMENT
- DOE M 473.2-1 Chg 1: FIREARMS QUALIFICATION COURSES MANUAL
- DOE O 541.1: APPOINTMENT OF CONTRACTING OFFICERS AND CONTRACTING OFFICER REPRESENTATIVES
- DOE 5480.20A: PERSONNEL SELECTION, QUALIFICATION, AND TRAINING REQUIREMENTS FOR DOE NUCLEAR FACILITIES

- DOE-STD-1056-93: *Guide to Good Practices for Line and Training Manager Activities Related to Training and Qualification*
- DOE-STD-1057-93: *Guide to Good Practices for the Selection, Training, and Qualification of Shift Technical Advisors, February 1993*
- DOE-STD-1059-93: *Guide to Good Practices for Maintenance Supervisor Selection and Development, February 1993*
- DOE-STD-1060-93: *Guide to Good Practices for Continuing Training, February 1993*
- DOE-STD-1061-93: *Guide to Good Practices for the Selection, Training, and Qualification of Shift Supervisors, February 1993*
- DOE-HDBK-1001-96: *Guide to Good Practices for Training and Qualification of Instructors*
- DOE-HDBK-1002-96: *Guide to Good Practices for Trng. and Qual. of Chemical Operators*
- DOE-HDBK-1003-96: *Guide to Good Practices for Trng. and Qual. of Maintenance Personnel*
- DOE-HDBK-1107-97: *Knowledge, Skills, and Abilities for Key Radiation Protection Positions at DOE Facilities*
- DOE/HR-0066: Total Quality Management Implementation Guidelines
- DOE-RW-0333P: Quality Assurance Requirements and Descriptions for the Civilian Radioactive Waste Management Program

2.8 Canceled DOE Directives

Many canceled or partially canceled DOE directives remain on the list because they may have been incorporated into a contract. Requirements of the canceled directives remain applicable until the contract has been renegotiated.

- DOE G 151.1-1: EMERGENCY MANAGEMENT GUIDE (**CANCELED**)
- DOE 1540.1A: MATERIAL TRANSPORTATION AND TRAFFIC MANAGEMENT PROGRAM (**CANCELED**)
- DOE 1540.2A: HAZARDOUS MATERIAL PACKAGING FOR TRANSPORTATION - ADMINISTRATIVE PROCEDURES (**CANCELED**)
- DOE 3790.1B: FEDERAL EMPLOYEE OCCUPATIONAL SAFETY PROGRAM (**PORTIONS CANCELED**)
- DOE 3792.2A: FEDERAL EMPLOYEE MOTOR VEHICLE SAFETY PROGRAM (**CANCELED**)
- DOE 4700.1: PROJECT MANAGEMENT SYSTEM (**CANCELED**)
- DOE 5400.1: GENERAL ENVIRONMENT PROTECTION PROGRAM (**PORTIONS CANCELED**)
- DOE 5400.2A: ENVIRONMENTAL COMPLIANCE ISSUE COORDINATION (**CANCELED**)
- DOE 5400.4: CERCLA REQUIREMENTS (**CANCELED**)

- DOE 5400.5: RADIATION PROTECTION OF THE PUBLIC (**CANCELED**)
- DOE 5440.4E: NATIONAL ENVIRONMENTAL POLICY ACT COMPLIANCE PROGRAM (**PORTIONS CANCELED**)
- DOE 5480.4: ENVIRONMENTAL PROTECTION, SAFETY, AND HEALTH PROTECTION (**PORTIONS CANCELED**)
- DOE 5480.6: SAFETY OF DEPARTMENT OF ENERGY-OWNED NUCLEAR REACTORS (**CANCELED**)
- DOE 5480.7A: FIRE PROTECTION (**CANCELED**)
- DOE 5480.8A: CONTRACTOR OCCUPATIONAL MEDICAL PROGRAM (**CANCELED**)
- DOE 5480.9A: CONSTRUCTION PROJECT SAFETY AND HEALTH MANAGEMENT (**CANCELED**)
- DOE 5480.10: CONTRACTOR INDUSTRIAL HYGIENE PROGRAM (**CANCELED**)
- DOE 5480.11: RADIATION PROTECTION FOR OCCUPATIONAL WORKERS (**CANCELED**)
- DOE 5480.13: AVIATION SAFETY (**CANCELED**)
- DOE 5480.15: DEPARTMENT OF ENERGY LABORATORY ACCREDITATION PROGRAM FOR PERSONNEL DOSIMETRY (**CANCELED**)
- DOE 5480.16A: FIREARMS SAFETY (**CANCELED**)
- DOE 5480.17: SITE SAFETY REPRESENTATIVES NUCLEAR (**CANCELED**)
- DOE 5480.18B: NUCLEAR FACILITY TRAINING ACCREDITATION PROGRAM (**CANCELED**)
- DOE 5480.24: NUCLEAR CRITICALITY SAFETY (**CANCELED**)
- DOE 5480.25: SAFETY OF ACCELERATOR FACILITIES (**CANCELED**)
- DOE Order 5480.29, EMPLOYEE CONCERNS MANAGEMENT SYSTEM (**CANCELED**)
- DOE 5480.31: STARTUP AND RESTART OF NUCLEAR FACILITIES (**CANCELED**)
- DOE 5481.1B: SAFETY ANALYSIS AND REVIEW SYSTEM (**CANCELED**)
- DOE 5482.1B: ENVIRONMENT, SAFETY AND HEALTH APPRAISAL PROGRAM ASSESSMENT REQUIREMENTS OF 10 CFR PART 830.120 AND DOE 5700.6C, QUALITY ASSURANCE (**CANCELED**)
- DOE 5483.1B: OCCUPATIONAL, SAFETY AND HEALTH PROGRAM FOR DOE CONTRACTOR EMPLOYEES AT GOVERNMENT-OWNED CONTRACTOR-OPERATED FACILITIES (**CANCELED**)
- DOE 5484.1: ENVIRONMENTAL PROTECTION, SAFETY, AND HEALTH PROTECTION INFORMATION REPORTING REQUIREMENTS (**PORTIONS CANCELED**)
- DOE 5500.1B: EMERGENCY MANAGEMENT (**CANCELED**)
- DOE 5500.2B: EMERGENCY CATEGORIES, CLASSES, AND NOTIFICATION AND REPORTING REQUIREMENTS (**CANCELED**)
- DOE 5500.3A: PLANNING AND PREPAREDNESS FOR OPERATIONAL EMERGENCIES (**CANCELED**)

- DOE 5500.4A: PUBLIC AFFAIRS POLICY AND PLANNING REQUIREMENTS FOR EMERGENCIES (**CANCELED**)
- DOE 5500.6B: SHUTDOWN OF DEPARTMENTAL OPERATIONS UPON FAILURE BY CONGRESS TO ENACT APPROPRIATIONS (**CANCELED**)
- DOE 5500.7B: EMERGENCY OPERATING RECORDS PROGRAM (**CANCELED**)
- DOE 5500.10: EMERGENCY READINESS ASSURANCE PROGRAM (**CANCELED**)
- DOE 5610.11: NUCLEAR EXPLOSIVE SAFETY (**CANCELED**)
- DOE 5700.6C, QUALITY ASSURANCE (**CANCELED**)

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APPENDIX C

DEVELOPMENT, IMPLEMENTATION, AND EVALUATION GUIDANCE FOR AN ISMS AT A HAZARD CATEGORY 2 NUCLEAR FACILITY

The need for Appendix C in this revision of the ISMS Guide (Rev. 1) has been superseded by revisions to Chapter III and Appendixes E and F. These revisions incorporate guidance and examples based on ISMS development and evaluation experience with implementing ISMSs at a number of Category 2 nuclear facilities. The guidance in Chapter III and Appendixes E and F on expectations, attributes, and experience in the development, review, and approval processes encompasses the Category 2 nuclear-facility-specific guidance that was previously in Appendix C, Rev. 0.

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APPENDIX D

DISCUSSION OF SAFETY MANAGEMENT ASSESSMENT

1. INTRODUCTION

The purpose of this appendix is to provide supplemental guidance for the use of assessments in Integrated Safety Management Systems (ISMSs). Additional guidance is provided in DOE G 414.1-1, IMPLEMENTATION GUIDE FOR USE WITH INDEPENDENT AND MANAGEMENT ASSESSMENT REQUIREMENTS OF 10 CFR PART 830.120 AND DOE 5700.6C, QUALITY ASSURANCE, and DOE G 450.3-4, ASSESSMENT.

The feedback and continuous improvement function is directly related to the effectiveness of assessments. To effectively accomplish the objectives of an assessment program, the assessment process needs to do more than develop a list of deficiencies. The process must produce a robust, rigorous, and credible assessment that is acceptable to the Department of Energy (DOE) and the contractor. The results can be used with confidence to accomplish the following:

- Identify areas that do not meet the requirements. These departures from requirements are generally called “deficiencies” or “findings.” Coincident with identifying problems, specific strengths and successes may be discovered that may be worthy of identification.
- Prioritize those problems identified using a prioritization system based upon each problem’s importance in the execution of ISMS policies. Such priority classification can be assigned by the assessor or the manager responsible for the expenditure of resources and program execution in the work area assessed or by both.
- Correct problems and follow up to help ensure that the problems assessed and prioritized for correction have in fact been corrected, and that the correction has been effective enough to result in sustained, long-term improvement for generic problems. Deficiencies or potential problem areas (e.g., from “lessons learned”) would generally result in a “watch list” of items for follow-up assessments.

A key component of the assessment process is an effective tracking and follow-up system. Additional information on the assessment process is being developed as part of the response to Defense Board Recommendation 98-1.

Although finding and correcting problems associated with the implementation of an ISMS, as described in the three steps above, is fundamental to the proper and effective execution of an ISMS in the organization assessed, a fourth effort is required to help ensure that other organizations learn from the problems identified and do not repeat them: that is, effective sharing

of significant assessment issues and identified strengths and successes, which can and should be an important mechanism for improving the effectiveness of ISMS in the DOE complex. Such an effort will enhance safety, save scarce resources, and improve mission effectiveness.

2. (TYPES OF) ASSESSMENTS

The overarching assessment should be developed within the framework of DOE P 450.5, LINE ENVIRONMENT, SAFETY AND HEALTH. This Policy's key element is a rigorous and credible contractor self assessment program that is linked to the DOE Safety Management System (SMS). Input to such an assessment is linked to and would derive substantial benefit from—

- performance measures and performance indicators,
- line and independent evaluations,
- compliance with applicable requirements,
- data collection, analysis, and corrective actions, and
- continuous feedback and performance improvement.

The results and conclusions of the contractor self-assessments are available to DOE.

There are many different types of individual assessments within DOE. For example, some assess compliance with the law, while others seek areas for improvement.

Some assessments are required by DOE directives as implemented at a site or facility. Many of the documents listed in Appendix B to Volume 2 of this Guide, "Resources for Complying with the SMS Policies, the FRAM, and the DEAR," describe assessment requirements, and some describe specific assessment processes.

Examples of these referenced requirements and descriptions include DOE O 225.1A, ACCIDENT INVESTIGATIONS, and DOE O 232.1A, OCCURRENCE REPORTING AND PROCESSING OF OPERATIONS INFORMATION, which describe specific types of assessments that focus generally on a specific event. DOE O 425.1A, STARTUP AND RESTART OF NUCLEAR FACILITIES, describes the much broader assessment processes involved in operational readiness reviews (ORRs) and readiness assessments required to evaluate the readiness of DOE nuclear facilities to conduct initial startup or to restart after specific types of shutdowns. DOE G 414.1-1, IMPLEMENTATION GUIDE FOR USE WITH THE INDEPENDENT AND MANAGEMENT ASSESSMENT REQUIREMENTS OF 10 CFR 830.120 AND DOE 5700.6C, QUALITY ASSURANCE, provide guidance in assessing Quality Assurance Programs with respect to the requirements of the Rule and the Order.

Other types of assessments include—

- assessments conducted by the Office of the Deputy Assistant Secretary, Oversight (EH-2),
- assessments associated with the administration of the Price-Anderson Amendments Act,
- routine and frequent performance assessments conducted in DOE facilities by Facility Representatives,
- verification (see Appendix E) of effective implementation of the requirements of an ISMS, which is a specific type of assessment associated with the establishment of an ISMS.

3. PRINCIPLES OF THE ASSESSMENT EFFORT

As stated in DOE P 450.5, the contractor and DOE have the following common principles:

- a. Work together to develop environment, safety, and health (ES&H) performance objectives, measures, and expectations that are tied to Department strategic goals and objectives, as well as to performance goals and objectives of the SMS elements. Mutual agreement is reached on expected ES&H performance.
- b. Work together to develop contract performance measures and performance indicators that are linked to the DOE SMS.
- c. Work together to develop a high level of performance assurance that results in improved ES&H performance.

4. ATTRIBUTES OF ASSESSMENTS

The introduction to this appendix briefly discussed the attributes of assessments. Those attributes were identification of problems/issues, prioritization of issues found with respect to significance, correction of identified issues, and promulgation of lessons learned from the identified issues/problems at other sites and facilities when doing so will add value to the complex. This section of Appendix D provides additional information about these attributes.

4.1 Identification of Problems/Issues

A systematic, organized approach to assessing performance in a facility with respect to integrated safety is required. An ad hoc approach in assessing performance will, more than likely, not be focused and, as a result, will be ineffective in evaluating the key aspects of compliance with requirements. Chapter III of this Guide provides guidance to assist contractors in developing and implementing ISMS. Chapter III can also assist assessment personnel in determining areas for review. The features discussed in this section should be considered when planning an assessment.

Those facilities in which the hazards are greatest should be the facilities that are assessed with the greatest rigor. However, all facilities should be assessed over some finite period of time.

Most assessments will probably be scheduled such that those doing the assessments can effectively schedule their time and prepare for the assessment and those being assessed can arrange the facility's schedule to accommodate the assessment and minimize its impact on ongoing facility work. Because all assessments may affect a facility's ability to do work, the impact of the assessments should be minimized wherever and whenever possible. For example, it is more cost effective to observe work when it is in progress than to schedule that work for observation outside normal operations.

In addition, there is a distinct advantage to conducting some assessments on an unannounced basis. It is only human nature to want to do well during any evaluation. Consequently, strong efforts to prepare for an assessment that has been scheduled are not unusual. Conversely, it is probable that there may be a natural relaxing of performance after an assessment is completed. The possibility of unannounced assessments will help to minimize the potential for reduced performance, especially if some unannounced assessments are periodically conducted. The routine day-to-day assessments of performance by facility managers at any level and by DOE facility representatives similarly need to be sufficiently random to prevent complacency in a facility. If a manager or facility representative always does the same thing when he or she spends time in the facility or if those people only conduct their assessments during the normal work day, Monday through Friday, the workers in the facility may assume that areas not being assessed or efforts ongoing on back shifts, weekends, or holidays are not as important to assessors. As a result, workers may tend to emphasize effective safety performance only in those places and during those times that their management or local DOE personnel emphasize. Data derived from such observations will be a very valuable input to the assessment process.

Assessors must also be knowledgeable in the areas they assess. They need to understand the requirements applicable to the areas they are assessing. These assessors also need to have technical competence in the areas being assessed. Assessors who are not knowledgeable in both the requirements to be evaluated and how to assess professionally will more than likely be ineffective. Assessors also need to be trained to the requirements for access to the facilities being assessed to the maximum extent practical to minimize the need for escorts from the facility. Additionally, training in areas in which facility personnel are trained, such as Rad Worker II, Criticality Safety, Conduct of Operations, etc., will prepare the assessor to consider those areas during the evaluation. An assessor who lacks the training required to perform effectively and professionally will not be credible and the effort may very well be wasted.

In conducting assessments, it is essential that the evaluation be done to requirements identified and not to some expectation of the assessor that is not a requirement. Assessors who have their own agendas, which they use instead of identified requirements, cause a counterproductive diversion of effort. On the other hand, an assessor who has good ideas for improving the

requirements or the methods used for operating a facility should provide those ideas to the appropriate organization for evaluation. These good ideas should be offered for what they are and should not be subject to the same rigorous approach appropriate for correction of identified safety deficiencies.

It is not unusual during an assessment to identify individual departures from requirements that are inappropriate to formally report and track to closure. For example, if a fire door is found blocked open when it should be shut, the assessor should tell someone in authority in the facility when it is discovered so that the fire door's function can be restored. If no other symptoms are found related to fire doors or similar fire safety discipline issues, cataloging this item as a deficiency would be inappropriate. Most facility representatives provide information concerning this type of deficiency to facility management at the appropriate level. If continued assessment reveals generic problems rather than isolated individual problems, more formal deficiency identification and correction tracking action would be appropriate.

4.2 Prioritization of Deficiencies

Once a deficiency has been formally identified as significant enough to be processed for correction, it should be assigned a priority for attention consistent with its significance. Either the organization doing the assessment or the one being assessed may assign the priority. If one of these two organizations disagrees on the priority assigned, a means should be available to resolve this difference.

The priority assigned to the deficiencies identified should be based on the safety significance of the items. There are many different schemes of assigning priorities to deficiencies. Whatever the scheme, it should not be too complicated and should help facility management focus on correcting the highest-priority and most important safety-related issues first. Both the assessors and the facility staff should understand the scheme used.

The number of priority categories should be sufficient to adequately categorize the comparative importance of the issues to be corrected and yet not so numerous as to make management impractical. Schemes observed have ranged from two to eleven priorities. Two categories probably do not give sufficient definition to prioritize; eleven make management of deficiency correction too complicated. Dividing priorities into three or four categories based on significance to safety will probably suffice.

4.3 Problem Correction

The combination of managing deficiencies of limited significance on the floor of the facility when they are found and the more formal process of identifying issues/deficiencies using an effective prioritization scheme should establish the foundation for managing facility safety in compliance with requirements. But all of this effort will be of little consequence without an effective way of

managing the correction of the deficiencies, validating that the correction has been completed, and, if the problem is generic, as some of the significant deficiencies may be, ensuring that the corrective actions taken are realistically extended to the areas in which they apply and not just to the correction of a specific deficiency. This diagnostic approach is the hallmark of effective assessment programs.

Many sites and facilities use an “issue management” or “deficiency tracking” scheme to manage the correction of identified problems, whether those problems are identified by the contractor, DOE locally or externally, or other assessment/oversight organizations such as EH-2 and the Defense Nuclear Facilities Safety Board. Normally, these management efforts use a computer tabulation of deficiencies, which can be sorted by priority as well as by other schemes useful to those responsible for managing the correction effort. Identification date, correction due date, variance with respect to schedule, responsible organization (such as “Maintenance”), or safety disciplines such as radiological controls or electrical safety are examples of other sorting categories that could be used.

At some sites, a computer printout of the issues being tracked is used effectively as a management review document. At other sites, the computer program in use may be so cumbersome and user unfriendly that it may not be readily available for use as a management aid at all. At some sites, facility managers and their staffs use the tracking system daily to monitor the status of the highest-priority deficiency listing. Whatever the scheme, responsible managers should review the highest-priority deficiencies most frequently and all deficiencies periodically depending upon priority assigned. This management technique helps facility management and staff focus on what is needed to correct the problems identified and helps them to determine what assets are needed to do the job; it also helps those responsible for the facility to be acutely aware of the safety status of the facility.

Tracking systems should be updated after each review and significant change in status. A user-friendly system, reviewed and updated at an appropriate frequency, and available to those who need it, can be an extremely effective management tool. A facility manager who ensures the tracking system is current and accurate at an appropriate periodicity can make this data available to his staff for their use, to the management to whom he reports, and to the local DOE management interested in that facility. All concerned can keep themselves informed of problem resolution status without unduly intruding on the managers involved with the corrective action.

4.4 Sharing of Significant Assessment Issues

The results of assessments that contain significant issues/problems of general applicability should be shared with other parts of the organization (i.e., other facilities at the same site) and with other organizations in the DOE complex to preclude those problems from occurring elsewhere. As appropriate, the process used to correct the problem should also be shared.

The objective of this sharing effort is to enable other organizations to evaluate their practices to determine if the same problem or a similar one exists requiring action to prevent safety problems that could adversely affect the public, the workers, or the environment. Using information developed from assessments to avoid problems is an effective way to enhance safety and facility mission performance that will enhance ISMS when used well.

An excellent example of feedback concerning operational issues with respect to DOE nuclear facilities is the "Operating Experience Weekly Summary" published by the Office of Nuclear and Facility Safety (NFS). This summary is available in either hard or electronic copy. This document provides assessment-like information (mostly from the Occurrence Reporting and Processing System reports), which contains timely, well-written, easily understood descriptions of the problem reported; some analysis of previous problems that were similar; and descriptions of some actions that were used or should be used to correct the problem and prevent recurrence. Even though these weekly summaries use information from nuclear facilities for the most part, the information provided for most of the events is valuable for evaluating safety performance in non-nuclear as well as nuclear facilities. Review of the material in these summaries on a weekly basis by those responsible for facility operations, both Government and contractor, will take but a few minutes, but has the potential to help enhance facility safety if the lessons learned are effectively applied.

5. OTHER CONSIDERATIONS

Many modern management methods have been tried and are being used to enhance performance in the work place. Quality circles, process improvement teams, and process action teams are among those efforts, and when done correctly, can result in improved organizational performance and safety. These methods, however, are not a substitute for assessments that evaluate the results of the assessed organization's safety performance. On the other hand, assessment results should be used as a source of information in the exercise of management techniques aimed at improving performance.

Some approaches for improving safety performance rely on the individual worker being responsible for a self-assessment effort that would, when done correctly, be the major contribution to safety assessments. There is no question that the work force should participate in improving safety performance with involvement, for example, in developing new procedures or in revising others, in enhanced work planning, in ensuring that all hazards are evaluated before performing work, and in self-checking, etc. Employee-related programs, such as a beneficial suggestion program, an employee concerns program, or a "hot line" reporting scheme, are appropriate and can enhance safety. But these are not assessment programs.

Some assessment regimes limit the window of time allotted to assessments. These limits, when applied, are intended to limit the impact of the assessment effort upon the facility being assessed from a time perspective and to force those doing the assessment to be organized and ready to

perform the assessment in a reasonable period of time. Today, DOE ORRs are generally completed within 2 weeks. Several years ago, they required a significantly longer period of time. The DOE ORR process was improved when DOE streamlined the process and required facilities being assessed to be as ready as possible when the start of the DOE ORR was recommended. In this context, limiting the time allotted to assessment efforts has been effective. But declaring that other assessment efforts may be limited to a specific time window may be counterproductive. Obvious examples include self-assessments conducted by a facility's manager. As a general rule, these managers should spend some significant portion of their time on a continuing basis evaluating the performance of work in their facilities.

The purpose of facility management assessment is two-fold:

1. to satisfy the facility managers doing the assessment that work is being done safely and effectively, in accordance with the requirements and standards that have been prescribed, and
2. to find areas of execution of the prescribed safety requirements and facility mission that are not being done satisfactorily so that the assessing manager can take action to correct the problems found and bring the organization back into compliance.

If these managers perform their assessment efforts effectively, assessors from outside the facility will find little during their assessments. Assessments conducted by external organizations on facilities that have been effective in managing their own assessment programs will have minimal impact because the facility staff will be found to be doing their work safely and effectively within the bounds of the specified requirements.

Based on the discussion in the paragraph above, one might conclude that a well-run facility would not need external assessments. Ideally, that is so. Probably the better conclusion would be that a facility found to have an exemplary ISMS would require less external assessment than a facility whose ISMS is not as strong. Key to DOE P 450.5 is the concept that DOE will first "verify, then trust." The best way to ascertain that a strongly performing facility stays strong is to assess facility performance. Some periodic assessment effort is required to ensure ISMS is still effective. The promise of routine scheduled, or unscheduled, external assessment also has the benefit of helping stimulate the facility to remain focused on performing its ISMS functions effectively.

Many people who conduct assessments tend to focus on administrative areas or documentation reviews. Such efforts may be appropriate for many assessments but only if limited to the extent that they help assess the daily performance of the workforce. Performance-based assessments that evaluate conformance to safety requirements are the most effective assessment approach. When weaknesses are uncovered that may be caused by inadequate programs, the administrative programs can be explored to help determine how much of the problem is programmatic.

6. CONCLUSION

Assessments in support of an ISMS are essential to validate compliance with requirements and to identify weaknesses requiring correction. Unless problems identified during the assessment are prioritized according to safety significance and corrected, the assessment process will be ineffective, no matter how well the assessment itself was done. Using lessons learned from the problems uncovered in assessments of other organizations is a cost-effective way to improve safety performance in a timely fashion.

Well-run, effective assessment programs have been drivers in improving performance and in sustaining improved performance. Assessments are an integral part of ISMS. DOE P 450.4 established the ISMS core functions, which are discussed in Chapter II of this Guide. Assessing performance of an organization in execution of each of the five core functions can be accomplished. Assessments are a cornerstone of the ISMS core function to "Provide Feedback and Continuous Improvement."

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APPENDIX E

ISMS EVALUATION GUIDANCE

1. BACKGROUND

Department of Energy (DOE) Headquarters direction for performing Integrated Safety Management System (ISMS) evaluations for the 10 priority defense nuclear facilities was first established by an Under Secretary Memorandum on February 21, 1997. This appendix describes a protocol for the review and approval of documented safety management system descriptions associated with defense nuclear facilities. This protocol has been used in the first six ISMS evaluations conducted across the complex. This appendix provides an overview of some of the more significant lessons learned as the process has become more mature throughout the complex.

Conducting an ISMS evaluation is a significant event and thorough planning efforts are required to achieve success. Sites and facilities have found that they must devote significant management attention to preparing for and conducting these evaluations. Line managers, the majority of safety management personnel, and facility operations, maintenance, and health and safety support personnel are involved in preparing for and/or supporting the review. ISMS evaluations significantly affect the normal routine. Support and involvement of senior line managers in the review are essential to success.

1.1 Role of the Approval Authority

The process of evaluating ISMS programs is described as verification or as the assurance that ISMS is implemented. DOE M 411.1, MANUAL OF SAFETY MANAGEMENT FUNCTIONS, RESPONSIBILITIES AND AUTHORITIES (LEVEL I FRAM), assigns to the head of the contracting activity (HCA) responsibilities to approve the safety management system description and revisions. Responsibilities as HCA are normally assigned to the manager of the cognizant DOE Operations Office, who is generally known as the approval authority. This terminology will be used in the following discussions for consistency. To carry out these responsibilities, the approval authority must decide whether a team review is needed and, if a team is needed, select members of the review team. The approval authority selects the team leader from a list approved by the Deputy Secretary. In addition to this guidance, the team leader and the assembled team should use the Draft Integrated Safety Management System Verification Process, Team Leader's Handbook (DOE SAFT-0065), to plan for and conduct the ISMS verification.

The approval authority should emphasize to the contractor the importance of having a complete, defensible ISMS before the verification review is scheduled. Having incomplete or missing documentation when the team begins its review only delays the process and wastes valuable

resources. Additional details of the role of the approval authority during the verification process are provided in Appendix 4 of the Team Leader's Handbook.

1.2 Role of the ISMS Verification Team

The strategy for reviewing ISMS documentation and recommending its approval, and the strategy for evaluating the adequacy of these systems' implementation is to employ a cadre of recognized senior safety and management professionals to conduct the review. The approval authority should have as a goal the development of such a cadre to locally support these evaluations.

The ISMS verification team's primary purpose is to review the adequacy of the ISMS and its implementation in order to provide a recommendation to the approval authority. A secondary purpose is to evaluate the role of DOE in support of the contractor's ISMS. The ISMS documentation, as submitted by the contractor, should meet the requirements of DOE policies, the DOE Acquisition Regulation (DEAR), and the contracting officer's guidance. The review should confirm the capability of DOE and the contractor to implement all aspects of the ISMS as described in DOE policies, the DEAR, and the FRAM. DOE's role in the success of the contractor's ISMS implementation is major and cannot be overstated.

1.3 Concept of the Review

The status of ISMS development and implementation varies across the complex. Each verification team, as directed by the approval authority, is faced with the challenge of establishing a tailored process to determine the adequacy of the documented ISMS, evaluate the success of the ISMS implementation, and provide a recommendation to the approval authority. Phase I is a review of the ISMS documentation as submitted to the approval authority by the contractor. Phase II is a review to verify that the ISMS has been satisfactorily implemented. To be successful, Phase I should not be restricted to an administrative review of the ISMS description but should extend to the procedures, policies, and manuals of practice used to implement safety management. The review should evaluate how these procedures, policies, and manuals of practice have been implemented at the upper levels of management and should also include detailed discussions with key management personnel who are assigned, or will be assigned, safety management responsibilities. The primary goal for the review is to provide a recommendation to the approval authority as to whether the ISMS documentation should be approved. To reach that conclusion, the team must develop a complete understanding of the safety management programs and determine that, when implemented, they will satisfy DOE requirements for ISMS and will adequately manage the safety aspects of the work and operations.

The form of the ISMS description is flexible and should identify all safety management plans, programs, and manuals of practice. The identified documents should be available for review. Review of these documents and determination of their adequacy forms the essence of the Phase I

review. In the review of the ISMS at a site, for example, it is important that the site implementation mechanisms are in place.

The Phase II review, which should be accomplished following review and approval of the ISMS documentation, is a review of the implementation of that ISMS. This is normally accomplished by sampling at various facilities and programs to determine that the safety management system outlined in the ISMS Description(s) is in fact being effectively carried out. At sites or facilities where a mature ISMS already exists, it may be possible to perform both phases of the review at the same time. It must be understood that experience to date with combined Phase I/II verifications has shown that they are difficult to do (see Section 3.4).

The verification team leader, with assistance from the team members, should prepare a detailed review plan. A key part of preparing the review plan is developing detailed, site-specific criteria review and approach documents (CRADs). These documents establish the initial scope of the ISMS verification and provide guidance to the ISMS verification team members. The importance of appropriately tailoring the CRADs to the management systems and operations of each site cannot be over-emphasized. The CRADs serve to focus the initial investigation by the review team. If the CRADs are too general, the review team may waste considerable time by (1) failing to focus on the pertinent ISMS issues and concerns and (2) duplicating the efforts of other members of the team. However, it should also be made clear to the reviewers that the review plan may need to be modified as the review progresses in order to accommodate new information that may have been overlooked in the initial site visit.

The review plan also serves as the primary means to communicate to the inspected contractor and DOE office the breadth and scope of the review. Sample CRADs and a completed ISMS Assessment Form from an example verification are included with this appendix. Further detailed information concerning these subjects is contained in the Team Leader's Handbook. ISMS descriptions, verification reports, and other significant information addressing the planning, scheduling, and accomplishing of ISMS evaluations may be viewed on the ISMS home page (<http://tis-nt.eh.doe.gov/ism>).

2. INTEGRATED SAFETY MANAGEMENT CORE EXPECTATIONS

The following core expectations were developed from the requirements of the DOE policies, the requirements of the DEAR, and the fundamental attributes that support the implementation of ISMS. These core expectations can serve as the basis for developing the CRADs. The following core expectations are annotated as being applicable to Phase I and Phase II. Phase I core expectations are used to evaluate the adequacy of the safety management documentation and the establishment of these programs at the site/corporate level. Phase II core expectations are used to evaluate the status of implementation at the facility, activity, or process level.

Note that the core expectations include expectations for the DOE field office. The DOE Policies, the DEAR, and the FRAM lay out expectations and requirements for DOE. The core expectations related to DOE are focused on those functions, responsibilities, and authorities that have a clear interface with the contractor's ISMS.

Sections 2 and 3 of Chapter III, Volume 1, discuss expectations for DOE and contractor ISMS development and implementation including system descriptions, gap analyses, manuals of practice, and integrating mechanisms. Such documents and descriptions can provide a focus to the investigation and are important to the development of a site-specific review plan.

2.1 Phase I ISMS Core Expectations

Nine core expectations are recommended for conducting the Phase I review. To be fully effective, the Phase I review should evaluate whether safety management programs and institutional processes have been implemented at the site/corporate level. The specific core expectations, which are italicized, are followed by a brief discussion that amplifies its meaning.

1. *The ISMS documentation is consistent with DOE P 450.4, the DEAR, and the guidance provided to the contractor by the approval authority.* The contractor's policies and procedures ensure that the ISMS is updated, maintained, and implemented and that the implementing mechanisms are sufficient to result in integrated safety management. This core expectation establishes the basis for acceptance of the ISMS description and serves to emphasize that DOE ISMS policy, DEAR requirements, and DOE's guidance to the contractor are the criteria being used for the evaluation. This core expectation may be viewed as a summary of the verification and, as such, forms the primary basis of the recommendation of acceptability of the ISMS to the approval authority.
2. *DOE and the contractor effectively translate mission into work, set expectations, provide for integration, and prioritize and allocate resources.* This core expectation supports the functions and principles of Define the Scope of Work and Balanced Priorities. DOE and the contractor should identify activities necessary to accomplish the assigned mission safely. The contractor should develop DOE-approved proposals into discrete work activities with manpower loadings and schedules. The contractor's ISMS should establish processes for establishing performance objectives that include DOE budget execution guidance and direction and that incorporate the principles of performance-based contracting. The ISMS should delineate how the environment, safety, and health functions are integrated into work planning and execution and should ensure that resources are effectively allocated to address safety, programmatic, and operational considerations. It is important to review the DOE and contractor budget and planning processes to determine that there is an integrated approach between DOE and the contractor to meet these criteria.

3. *An ISMS should include methods for identifying, analyzing, and categorizing hazards.* This core expectation supports the function of Analyze Hazards. The ISMS should identify how hazard analyses are performed at each organizational level from the work defined in the sitewide mission, to the processes at an individual facility (as in a Safety Analysis Report), to the individual operational or maintenance activity that is contemplated within a facility (as in a job task analysis or job hazard analysis). The hazards analyzed should include nuclear as well as chemical and common industrial hazards. The analysis should be balanced to the complexity and significance of the risk. Both contractor and DOE processes to review and approve hazards analyses should be evaluated.
4. *The ISMS should include methods for establishing and maintaining an agreed-upon set of safety standards before work is performed.* This core expectation supports the functions and principles of Develop/Implement Hazard Controls, Identify Safety Standards and Requirements, and Hazards Controls Tailored to Work Being Performed. Standards and requirements for the safe accomplishment of work consistent with the DEAR and a process for establishing administrative controls, safety controls, safety programs, and other conditions on the work should be established. The ISMS should include processes the contractors and subcontractors will use to implement controls. The ISMS should delineate the means by which the controls are established at each organizational level from the work defined in the sitewide mission (as established by DOE-approved processes; e.g., S/RIDS, Work Smart Standards, etc.) to the processes at an individual facility (as in Technical/Operational Safety Requirements) to the individual operational or maintenance activity that is contemplated within a facility (as in controls established by job hazard analyses and work control procedures). The methods should ensure that the controls remain in effect so long as the hazard is present. The process whereby DOE and the contractor agree to, maintain, and revise the standard set should be reviewed.
5. *Contractor policies, procedures, and documents are established and are adequate for the work or process to be performed safely.* This core expectation supports the functions and principles of Perform Work and Operations Authorization. Procedures and programs should be adequate to ensure work is performed within controls that have been developed and implemented. Controls may include site or facility commitments, such as conduct of operations programs, worker safety programs, specified engineered safety systems, or specific controls in worker safety permits. The ISMS should establish a process to ensure that the facility or process and the operational work force are adequate for the work or processes to be performed safely and that safety requirements are integrated into work performance. A process should be established to gain authorization to conduct operations. Provisions should be included to grant operations and authorizations for each level of efforts at the site, facility, activity, or process. The ISMS should include a process to identify performance measures, including safety system performance measures for the work. Procedures to maintain the Operations Authorization current should be described.

6. *The ISMS should be continuously improved through an assessment and feedback process which should be established at each level of work and at every stage in the work process.* This core expectation supports the function of Feedback and Improvement. The ISMS should be subject to continuous improvement through an assessment and feedback process. At each level of work and at every stage in the work process, the feedback and continuous improvement programs should be functioning. Feedback information on the adequacy of controls is gathered, opportunities for improving the execution and planning of the work are identified and implemented, line and independent oversight is conducted, and if necessary, regulatory enforcement actions occur. The role of DOE in reviewing the contractor's work quality, assessing the adequacy of safety controls, conducting oversight, and enforcement should be included as a part of this criterion. The ISMS should describe a process to implement safety performance objectives and performance measures and should delineate the means to be used to measure system performance. See Volume II, Appendix D, for a further discussion.
7. *The ISMS should establish that at every level of control, line management must be responsible for safety. Clear and unambiguous roles and responsibilities should be defined and maintained at all levels within the organization.* This core expectation supports the principles of Line Management Responsibility for Safety and Clear Roles and Responsibilities. All aspects of work identification, planning, and execution must be under the control and responsibility of line management. Support organizations such as ES&H or Human Resources must have clearly defined roles and responsibilities in support of line management, that ensure work is performed safely, within the clearly defined principle that line management is responsible for safety.
8. *The ISMS should ensure that personnel are competent commensurate with their responsibility for safety.* This core expectation supports the principle of Competence Commensurate with Responsibility. The ISMS should ensure that personnel possess the experience, knowledge, skills, and abilities necessary to discharge their responsibilities. Support and line personnel—workers as well as managers—should have core competencies. Actual competence as well as the programs to define expectations, provide training, and evaluate whether expectations are met, should be addressed. The process for determining the required competence should consider the roles and responsibilities of each position and the knowledge and the performance of the incumbents.
9. *The DOE approval authority should have a set of processes that interface efficiently and effectively with the contractor organization.* DOE processes must include elements of the other core expectations as they apply to the responsibilities of DOE to translate missions into work, set expectations, and allocate resources as well as approve, control, and authorize operations. DOE's safety management responsibilities should be met as described in the FRAM. The correlation between the Headquarters FRAM and the site FRA should be evaluated.

2.2 Phase II Core Expectations

The following eight core expectations should be considered during a Phase II assessment of ISMS implementation following approval of the ISMS description. This assumes that the approval authority has formally approved the ISMS description or has approved it with comments. This acknowledges that contractor-integrated safety management programs are satisfactory at the corporate or site level. Any comments that affect the adequacy of the safety management programs should be resolved and incorporated before the Phase II review occurs. Specific core expectations are italicized and a brief discussion follows each core expectation statement to amplify its meaning.

1. *An integrated process has been established and is utilized to identify and prioritize specific mission discrete tasks, mission process operations, modifications and work items.* The above should be translated into discrete tasks that personnel can understand and control. Specific tasks, operations, or work items should be identified and prioritized through a process that integrates responsible organizations if multiple organizations are involved.
2. *The full spectrum of hazards associated with the work or task has been identified, analyzed, and categorized. Those individuals responsible for the analysis of the environmental, health and safety, and worker protection hazards are integrated with those personnel assigned to analyze the processes.* Formal approval of the analyses should be evident and workers should be aware of the consequences of dealing with the hazards. The analyses should be a comprehensive review of all hazards and a process should be established to integrate all spectrums of hazards (e.g., from the consequences of analyses developed by a SAR to the consequences of worker protection concerns). Personnel responsible for the analysis of environment, safety, and health effects should be effectively integrated into the contractor's line organization and work closely with those individuals responsible for the analysis of the processes.
3. *An integrated process has been established and is utilized to develop controls which mitigate the identified hazards present within a facility or activity. The set of controls ensure adequate protection of the public, worker, and the environment and are established as agreed upon by DOE. These mechanisms provide integration which merge together at the workplace.* Safety requirements are identified and are effectively adapted within a process that integrates the diverse activities and hazards present within the facility or activity. The set of requirements must be comprehensive and should ensure adequate protection of the public, worker, and the environment.

4. *An integrated process has been established and is utilized to effectively plan, authorize and execute the identified work for the facility or activity. Both workers and management demonstrate a commitment to ISMS. Personnel assigned responsibility for completing work are instructed on the hazards and the engineered and administrative controls that will be used to control them. Management has established and is committed to processes that effectively integrate resources including ES&H professionals to control all hazardous activities. Appropriate mechanisms are in place to authorize the performance of the work, including a process that confirms readiness to perform the work before it is started. The established safety culture promotes a good understanding and support for ISMS.*
5. *An integrated process has been established and is utilized which ensures that mechanisms are in place to ensure continuous improvements are implemented through an assessment and feedback process, which functions at each level of work and at every stage in the work process. Safety performance is routinely measured by line managers and is periodically validated by independent assessment techniques. Recommended improvements are appropriately evaluated and are implemented when proven to be needed to enhance safety.*
6. *Clear and unambiguous roles and responsibilities are defined and maintained at all levels within the facility or activity. Facility or activity line managers are responsible and accountable for safety. Facility or activity personnel are competent commensurate with their responsibility for safety. There is a good understanding of the flow of responsibilities from the facility manager to the floor level workers and operators. A well defined statement for the responsibility and accountability for safety exists and is understood. Workers/operators are qualified to perform their duties and perform them safely. Managers are involved in establishing the details of the training programs and participate in them as appropriate.*
7. *DOE ISMS procedures and mechanisms should ensure that work is formally and appropriately authorized and performed safely. DOE line managers should be involved in the review of safety issues and concerns and should have an active role in authorizing and approving work and operations. The appropriate level of DOE managers should be involved in the review of safety issues and concerns and should have an active role in authorizing and approving operations.*
8. *DOE ISMS procedures and mechanisms ensure that hazards are analyzed, controls are developed, and that feedback and improvement programs are in place and effective. DOE line managers are using these processes effectively, consistent with FRAM and FRA requirements. DOE line managers have implemented all interface processes identified in the Phase I review and are using these processes effectively.*

3. CONDUCT OF THE REVIEW

The quality of the ISMS evaluation is determined by a variety of factors. The team selected must have the required expertise or must be trained accordingly. Team member activities must be carefully planned and coordinated so that the full scope of the review is accomplished. The review sequence must be planned to efficiently accomplish the review within the prescribed time period. Should the approval authority direct a combined Phase I and II review, the review must be carefully planned to ensure that the objectives of both phases are adequately evaluated. In some cases, normally established site performance evaluation processes can be used to conduct ISMS reviews.

3.1 Team Selection

Selection of the proper team is a key element in conducting a successful ISMS verification. The following team member experience has been considered to be beneficial:

- expertise in a functional area;
- site experience (especially familiarity and understanding of site programs);
- assessment experience (assessments/audits/ORRs/RAs);
- ISMS training (knowledge of ISMS Policy, Guide, and Team Leader's Handbook); and
- familiarity with DOE FRAMs.

Additional details on the important attributes of the team members are provided in Sections 5.5.2 and 6.3.2.2 of the Team Leader's Handbook.

Dedication and continuity of the team in the review process are essential. It is useful to have one team member assigned to each objective or common objective set. This simplifies the report-writing responsibilities and ensures ownership for the report product. When the review phases are separate, it is beneficial for the Phase I reviewer to continue as a Phase II reviewer. The Phase I review prepares the reviewer to do a thorough and competent Phase II review. Consideration of the size of the team is an important decision. Too large a team makes coordination difficult. From the perspective of recent site ISMS reviews, a team of 15-18 was determined to be required for the Phase I review. A Phase II review of one of the facilities at this site required a team of 7-8. The complexity of the site/facility and hazards involved should be instrumental factors in determining team size.

3.2 Team Assignments

To most efficiently conduct the review, it is useful to delineate related safety management and support programs in discrete groups called "functional areas." By establishing these groupings, personnel can be assigned team responsibilities in designated review areas for which they have the

required expertise. Functional areas used in past reviews have been synthesized in the ISMS Team Leader's Handbook into distinct Phase I and Phase II areas that can be further synthesized for combined Phase I/ Phase II verifications. These include the following:

- | Phase I | Phase II |
|--|---|
| <ul style="list-style-type: none">• Business, Budget, and Contracts (BBC),• Hazards Identification and Standards Selection (HAZ),• Management (MG),• DOE. | <ul style="list-style-type: none">• Operations and Implementation (OPI),• Subject Matter Experts (SMEs),• Hazards Identification and Standards Selection (HAZ),• Management (MG),• DOE. |

Within Phase II it has been necessary to include SMEs to ensure that specific safety management functions are effectively addressed. SMEs to be considered may include experts in the following disciplines:

- Criticality Safety,
- Fire Protection,
- Industrial Hygiene and Safety,
- Radiation Protection,
- Security,
- Training and Qualification,
- Maintenance and Work Control,
- Quality Assurance,
- Configuration Management, and
- Environmental Compliance (including pollution prevention/waste minimization).

The specific SMEs to be used should reflect the level of risk, complexity of the operation, and past performance. For example, if recent operational readiness reviews (ORRs) or site evaluation processes have indicated that a programmatic functional area such as radiation protection is rigorously established, it may not be necessary to review this program in great depth during the ISMS verification. This type of tailoring should be used in preparing the ISMS verification review plan. Evaluation of maintenance and work control is recommended in every instance.

3.3 Review Sequence

The sequence for conducting the review should be carefully considered. The following is a typical chronology of a 4-week review sequence used for a Phase I ISMS verification at a major DOE site. A Phase II verification sequence would be similar, but generally could be accomplished in fewer days on site.

- An initial site visit by the team leader is conducted well before the start of the review to meet site personnel responsible for ISMS and discuss the conduct of the review.
- A 3-day site visit prior to the review is used to train the team, explain the verification methodology, and develop the CRADs to be used for the review. The pre-visit provides an opportunity for the team to meet management personnel responsible for developing the ISMS description.
- The review commences with a 1-week period allotted for contractor and DOE management briefings to the team. The goal is to allow the contractor to fully explain the status of ISMS. Following these presentations, the team develops a list of personnel to be interviewed and records requested for review. The briefings are considered essential for the team to enable them to fully understand the safety management programs. The quality of the briefings is important. The contractor's expertise in providing the necessary information, with the correct amount of detail, is important to ensure the team has enough information to enable them to efficiently conduct the review. If conducted correctly, these briefings provide instant feedback about the strengths and weaknesses of the ISMS mechanisms. Guidance from the team leader to the contractor and DOE on the content and format of the briefings is a key factor in the success of this effort. It is necessary for the contractor to assign a point of contact for coordinating all aspects of the ISMS review with the ISMS review team.
- A 1-week period is allotted for the actual review. This review occurs 2 weeks following the contractor briefings. The report is written the following week before the team departs the site.

The process of obtaining the contractor information by receiving the detailed briefings discussed above can be achieved in a variety of ways. Some success has been experienced with eliminating the site pre-visit. Instead, appropriate documentation was sent electronically or mailed to team members and teleconferencing was used for initial team coordination. This approach is viable, but becomes less so as the scope and complexity of the review increases. Experience with this technique has shown that eliminating the pre-visit should only be considered with an experienced team. The ISMS description, verification review plan, and supporting documentation should be available to the team members approximately 2 months before the verification. This will permit ample time for the team to study the documentation, ask questions, and receive answers and clarification. It has also been found necessary to hold at least two teleconference calls before arriving at the site.

3.4 Combined Phase I and II Reviews

The approval authority may elect to direct a combined Phase I and Phase II review at sites or facilities with a mature ISMS effectively in place. While this appears to be a timely way to accomplish the verification, a combined review can be complicated and difficult to coordinate.

Combined reviews conducted to date have shown that it is important to carefully factor into the decision the size and complexities of hazards and the maturity of the existing safety management system. If it is still considered proper to combine the two phases into one review, the following comments should be carefully considered:

- The review of the ISMS description and the review of manuals of practice must be carefully coordinated with the review of the implementation of the ISMS mechanisms. The natural tendency is to concentrate too much on the Phase II portion of the review to the detriment of evaluating Phase I issues and concerns. The CRADs for a combined review should be carefully developed to ensure the review approaches are clearly described.
- The verification team should be well experienced. It is beneficial to assemble a team that has had some experience in conducting both phases of ISMS verifications.
- The verification team should have ample opportunity to review the ISMS description, verification plan, and supporting documentation well ahead of the scheduled verification. Ample time should be provided to allow the team to study the documentation, ask questions, and receive answers and clarification of their issues and concerns prior to starting the review.

The combination of Phase I and Phase II reviews has recently been attempted at a number of sites. Separating Phase I issues and concerns from Phase II issues and concerns in the report documentation is challenging. One technique that appears to have merit is to split the team along functional area assignments. In this instance the Phase I team consisted of the management team; business, budget, and contracts team; and the hazard team. The Phase II team consisted of the Operations and Implementation team, including the subject matter experts.

A careful review of CRADs developed in the ISMS Team Leader's Handbook is recommended prior to finalizing a verification approach.

3.5 The Use of Routine Evaluations for ISMS Reviews

At sites where formal performance evaluation teams are functioning, it is appropriate to include ISMS verifications in conjunction with normal performance evaluations. For example, one site has chosen to conduct facility ISMS Phase II verifications in conjunction with the normally occurring facility evaluation process. To assist the performance evaluation team in determining if the evaluation was effective, personnel experienced in conducting ISMS reviews observed a recent facility evaluation, including an ISMS Phase II review.

4. EXAMPLE CRADS

The following CRAD is provided as an example used to conduct a Phase I review for the business, budget, and contracts team during a recent verification. A full set of sample CRADs is provided in Appendices 2 and 3 of the ISMS Verification Team Leader's Handbook.

CANCELED

EXAMPLE
CRITERIA AND REVIEW APPROACH DOCUMENT
FOR ISMS VERIFICATION AT OAK RIDGE Y-12 PLANT

BUSINESS, BUDGET, AND CONTRACTS (BBC)

OBJECTIVE:

BBC.1 Department of Energy (DOE) and contractor procedures ensure that missions are translated into work, expectations are set, tasks are identified and prioritized, and resources are allocated.

Criteria:

DOE procedures translate programmatic missions reflected in strategic plans, binding commitments, and other requirements into work expectations and priorities that are authorized and communicated to the contractor.

Contractor procedures translate work expectations received from DOE into tasks that permit identification of resource requirements, relative prioritization, and performance measures.

DOE and contractor procedures provide for DOE approval of the contractor's proposed tasks and prioritization of the mission expectations transmitted to the contractor, and for feedback and continuous improvement.

DOE and contractor procedures provide for change control of the approved task identification, prioritization, and funding.

DOE has incorporated DOE Acquisition Regulation (DEAR) 970.5204-2 "Integration of Environment, Safety and Health into Work Planning and Execution" into their contract and contract procedures, which provide for flowdown of the DEAR requirements into subcontracts involving complex or hazardous work.

Site procedures ensure that translation of mission into tasks flows from DOE to the Management and Operating Contractor (M&O) to the subcontractors, to the individual facility, process, or work task as appropriate.

Tasks at the facility level are funded in accordance with the specified procedures. Funding of safety is integrated with funding of the tasks.

Approach:

Record Review:

- Defense Programs Strategic Plan, the Directive Work Schedule and other site agreements and action commitments. Review AC-500, Task-Based Management System; ESS-MS-131, Integrated Resource Management System; ESS-FE-101, Cost Estimating; PC-164PD Services Subcontract Safety and Health Management; and Y10-202 Integrated Safety Management Program. Review procedures for control and integration of weapons program task and funding with DOE Headquarters infrastructure and program funding. Review contractor Work Authorization Directives, as well as the procedures for their development. Review DOE-YSO and/or DOE-ORO procedures for identification of mission requirements, resources allocations, and approval of contractor Task-Based Management System (TBMS). Review Lockheed Martin Energy Systems (LMES) and DOE change control procedures. Review LMES procedures for work authorization and control in compliance with the DOE approved TBMS. Review LMES and DOE procedures requiring safety requirements flowdown into subcontracts. Review tasks funded and the funding process for individual facilities.

Review YSO and ORO procedures that define the process and expectations for translation of mission and commitment requirements into tasks and direction for contractor action. Review processes for review, approval, and change control of the TBMS or other binding budget documents.

Select mission tasks from the Defense Programs Strategic Plan and the Directive Work Schedule and track the tasks through the process to evaluate how the above criteria are met. Review past year planning for current year authorized work as well as future year planning. Select several current year authorizations and track change control from DOE (Albuquerque and Headquarters) to the LMES and to the affected Y-12 Plant facility. Select several LMES subcontracts and review for appropriate flowdown clauses.

Interviews: Interview DOE personnel responsible for managing the budget process. Interview line managers responsible for Headquarters as well as Albuquerque Weapons Program directed mission accomplishment. Interview LMES managers responsible for the budget process, including members of the Executive Steering Group. Interview line managers at each level from the LMES vice president to the facility manager to determine understanding and implementation of the defined process for translation of mission into work authorization. Interview ES&H professionals and line managers at each level to determine how safety is incorporated into the budget plans and authorization. Interview DOE and LMES procurement personnel regarding subcontract flowdown requirements.

Observations: If possible, observe an Executive Steering Group meeting and actual budgetary discussions (including meetings involving the development of the FY99 or FY00 TBMS) within and between LMES and DOE to observe the practical application and results of the procedures.

5. EXAMPLE EVALUATION

The following completed ISMS Assessment Form from a recently completed ISMS verification is provided as an example in documenting the results of a Phase I review for the Management subteam during a recent verification.

CANCELED

EXAMPLE
ISMS ASSESSMENT FORM
FOR ISMS VERIFICATION AT OAK RIDGE Y-12 PLANT

Management

FUNCTIONAL AREA: MG	OBJECTIVE: 2 DATE: August 12, 1998
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OBJECTIVE: Feedback information on the effectiveness of the ISMS is gathered, opportunities for improvement are identified and implemented, line and independent oversight is conducted, and, if necessary, regulatory enforcement actions occur.

Criteria:

Contractor ISMS procedures describe clear roles and responsibilities to provide feedback and continuous improvement including line management responsibility for safety.

Contractor ISMS procedures require line and independent oversight or assessment activities at all levels. Oversight and assessment activities verify that work is performed within agreed upon controls.

Contractor ISMS procedures ensure oversight or assessment results are managed to ensure lessons are learned and applied throughout the site; that issues are identified and managed to resolution; that fundamental causes are determined and effective corrective action plans are developed and implemented.

Contractor ISMS procedures ensure that performance measures or indicators and performance objectives are developed in coordination with DOE as required. Further, contractor ISMS procedures require effective management and use of performance measures and objectives.

Contractor ISMS procedures provide for regulatory compliance and enforcement as required by rules, laws, and permits such as PAAA, NEPA, RCRA, CERCLA, FFCA, etc.

Approach:

Record Review: Review Y/DN-317, Y60-028, QA-312, QA-331, QA-901, QA-911, and the Conduct of Operations Manuals to determine the procedures, processes and requirements which meet this objective. Assessments include regulatory compliance in accordance with laws, rules, and permits.

Review the results and schedules of self assessments and independent assessments at each organizational level. Review procedures for scheduling and tracking routine assessments. Review procedures for analysis of the results of assessments and the results of those analyses.

Review selected assessment results. Review results and actions resulting from resumption readiness reviews and from assessments in response to Defense Nuclear Facilities Safety Board Recommendation 94-4. Track issues identified during the assessments to completion. Assess the effectiveness of the assessment and feedback process to achieve process improvement.

Review the issues management program for adequacy, effectiveness, and support for process improvement.

Review the performance measures or indicators and performance objectives. Review the process for development of the indicators including how the development and change is coordinated with DOE.

Interviews: Interview managers down to facility levels to determine the adequacy and effectiveness of the assessment activities. Interviews should include all aspects of this objective. Interview Contractor Assessment personnel to determine the adequacy and effectiveness of the Site Integrated Oversight Program, as well as other compliance or independent assessment programs at any level of management.

Observation: If possible, observe senior management assessment or self-assessment activities, including documentation and post activity briefing of results. Observe a critique or management review including development of lessons learned and root causes.

Record Review:

- QA-312, Issues Management Program, Rev. 1
- QA-331, Lessons Learned Program, Rev. 0
- QA-901, Independent Assessments, Rev. 1
- QA-911, Management Assessment, Rev. 0
- ESS-MS-131, Integrated Resource Management Systems, Rev. 2
- Y60-028, Y-12 Plant Management Assessment, 9/20/96
- Y/DN-317, Assessment Program Description for Y-12, Rev. 1
- Standing Order SO-EUO-98-015, Enriched Uranium Operations (EUO) Management Assessment Program, 6/30/98
- CY-1998 Performance Plan for Disassembly and Storage Organization
- Disassembly and Storage Organization Facility Tour Reports PRW-1, PRW-2, PRW-3, PRW-98-4, PRW-98-5, PRW-98-6, 6/98, 7/98, JER-98-002, JER-98-004, JER-98-003, JER-98-001, 98-5, PRW-98-7
- Depleted Uranium Operations (DUO) Integrated Management Assessments (CY98)
- Annual Management Assessment Schedules for LMES
- Y10-202, Integrated Safety Management Program, 6/23/98

- Y15-635PD, Energy Systems Integrated Safety Management System, 6/30/98
- Standing Order SO-EUO-98-014, Enriched Uranium Operations (EUO) Energy Systems Action Management System (ESAMS) Closure Process, 5/22/98
- Y60-183, Surveillance, 11/11/98
- QA-904, Surveillance, Rev. 1
- CY-1998 Performance Plans for management and staff within DUO and Disassembly and Storage Operations (DSO)
- Numerous e-mails on lessons learned and required responses
- Minutes from the Issues Management Prioritization and Risk Board
- Charter for the Y-12 Issues Management Prioritization and Risk Board, Rev 2, June 1997
- Chapter 6 of the *Nuclear Operations Conduct of Operations Manual*
- Select DUO Management Review Reports, June - August, 1998

Interviews Conducted:

- Facility Safety Manager, Nuclear Safety Organization
- Manager, Product Certification
- Lessons Learned Coordinator, Enriched Uranium Operations
- Manager, EUO Administrative Support
- Operations Manager, Building 9204-4
- Manager, Quality Services
- Y-12 Plant Lessons Learned Program Manager
- Operations Manager, Disassembly and Storage Operations
- Issues Manager, Depleted Uranium Operations
- Shift Technical Advisor, Lithium Processing
- Restart Issues Manager, Enriched Uranium Operations
- Issues Manager, Disassembly and Storage Operations
- Y-12 Plant Assessments Program Manager
- Y-12 Plant Issues Manager
- Lessons Learned Data Programmer
- Manager, Nuclear Operations
- Deputy Manager, Nuclear Operations
- Manager, Environmental Compliance

Observations:

- Monthly Y-12 Plant Issues Management Meeting
- Monthly Central Safety, Health, and Environmental Affairs Committee

Discussion of Results:

Record Review: The ISMS program description (Y15-635PD) and numerous procedures were reviewed to determine whether roles and responsibilities were clearly defined regarding feedback and continuous improvement. There is an adequate flow down of ISMS philosophy (regarding the need for feedback and continuous improvement) from Y15-

635PD to the implementing procedures. Procedures Y60-028, *Y-12 Plant Management Assessment*, and QA-312, *Issues Management* require line management to establish and implement an assessment program of their operations. Procedure QA-901, *Independent Assessments* defines the roles and responsibilities for those LMES organizations that perform independent assessments. Procedure QA-331, *Lessons Learned*, requires the identification and dissemination of operating experiences that may be applicable to other line management organizations. Throughout all these documents, line management is clearly identified as being responsible for safety.

However, a plethora of assessment procedures exist within LMES, which may lead to confusion regarding reporting requirements and individual assessment responsibilities. For example, there are two management assessment procedures (QA-911 and Y60-028), as well as two surveillance procedures (QA-904 and Y60-183). The level of documentation and record retention requirements varies based on the procedure used to conduct the assessment. These redundant procedures are a carryover from when LMES managed five plants in the Oak Ridge complex and had a central organization as well as plant-specific organizations with corresponding procedures. However, this organization no longer exists and LMES solely manages the Y-12 Plant. LMES management recognizes this problem and plans to review, consolidate, delete, or upgrade procedures as appropriate. The prompt completion of this consolidation effort is sorely needed (MG2-3).

Annual assessment schedules have been prepared for all management, direct report organizations reporting to the Vice President of Defense Programs. These schedules contain information such as the assessment type, the subject of the assessment, functional area, scheduled date, completion date, and who performed the assessment. This is commendable; however, there is a significant disparity in the level of assessment activity within the different Y-12 Plant organizations. For example, both DSO and DUO have developed and implemented a fairly extensive management assessment program. Organizations such as General Manufacturing and Environmental Compliance have a limited assessment program. Based on a review of the annual assessment schedules, the General Manufacturing Organization has only scheduled two assessments for FY 1998. Likewise, the Environmental Compliance Organization has performed limited self-assessments during FY 1998 (MG2-4).

There is also a disparity in the breadth of line management assessment activity within an organization. Even though DSO has a fairly well-developed and implemented management assessment program, management assessments have not been consistently performed by line managers within all levels of DSO. For example, numerous line managers within Building 9204-2E have not scheduled or performed management assessments of their operations. Management within all levels of an organization should assess their operations for improvement opportunities.

Independent assessments have also been scheduled and performed. An integrated independent assessment schedule was reviewed as well as assessment results. The Quality Services organization primarily carries out the independent assessment program. This program is developed and functioning.

Regarding issues management, the governing procedure is QA-312, *Issues Management*. Per the procedure, an issue is broadly defined to include “problems, deficiencies, findings, concerns, alerts, recommendations, observations, and other conditions requiring evaluation for corrective action.” Likewise, QA-312 addresses tracking, the need for root cause analysis, and the level of independent verification needed to close an issue.

Although QA-312 does provide a framework for managing issues, it lacks clarity and consistency in a number of areas. For example, issues are managed differently if identified by an internal rather than an external source. (External sources include LMES independent assessments.) QA-312 states that the procedure does not apply to “Divisional management assessments.” This has been interpreted by some to include management assessments performed in accordance with Y60-028. QA-312 requires that issues be ranked in accordance with the risk matrix found in ESS-MS-131, *Integrated Resource Management System*. QA-312 also requires formal root cause analysis and independent verification of closure for issues identified as “significant.” However, during interviews with line management personnel, risk ranking, root cause analysis, and independent verification of closure is only required for issues identified by external organizations. Consequently, many issues identified during internal management assessments (i.e., Y60-028) are not always analyzed with the same degree of rigor (MG2-5).

The tracking of issues also varies based on whether the issue was identified by an internal or external organization. Issues identified externally are clearly tracked through the Energy Systems Action Management System (ESAMs). Procedure QA-312, in conjunction with ESS-MS-131, provides requirements on managing the ESAMs tracking system. However, issues identified internally within an organization are tracked in a variety of ways. For example, within DUO, issues identified during DUO management assessments are tracked by a unique DUO tracking system (not connected with ESAMs). Issues identified during DSO management assessments are tracked in ESAMs as “management commitments.” EUO also tracks management assessment issues as management commitments in ESAMs.

QA-312 and ESS-MS-131 are silent on how issues (entered into ESAMs as management commitments) are managed. More specifically, the degree of root cause analysis, prioritization, and verification are not defined for ESAMs issues identified as management commitments. The potential exists to place “significant” issues into ESAMs as management commitments and preclude a thorough analysis of risk, root cause, and independent verification. In fact, a recent DOE operational readiness review (ORR) identified this as an issue within EUO. In short, the ORR found that the closure of EUO management commitments in ESAMs were often incomplete. As a result, Standing Order SO-EUO-98-014 was implemented to address this concern. This standing order requires the use of an

OSB to review management commitments for significance and possible root cause analysis. In this case, the OSB may serve as a substitute for the Issues Management Prioritization and Risk Board (IMPRB).

Lastly, QA-312 is silent on the use and function of the IMPRB. This board is chartered with risk prioritization of issues identified by external organizations. Although a charter exists and meeting minutes have been drafted, nowhere is the function of the IMPRB described in any LMES program or procedural documentation.

The use of performance indicators was also evaluated. Performance indicators are used at various levels of the LMES organization. For example, at the upper management level, DOE has incorporated performance measures in the LMES-DOE contract. At the other end of the spectrum, DSO has incorporated performance measures within the performance plans of key management personnel. These indicators include both production and safety goals. In addition, performance indicators are used extensively in the environmental protection area. Permit noncompliances, the number of spills, and regulatory inspection results are tracked and reported.

Interviews: Numerous interviews were held with a variety of personnel to evaluate their understanding of the Y-12 Plant feedback and assessment process. Key personnel such as the Y-12 Plant issues manager, assessment manager, lessons learned coordinators, and line managers were interviewed. In general, personnel were aware of the importance of a thorough and well-developed feedback and assessment program.

Those involved in the lessons learned program were knowledgeable of their roles and responsibilities. The lessons learned program is web based and basically available to all LMES and DOE Oak Ridge personnel. The lessons learned program appears to be well managed and a helpful aid in sharing operational information with line managers. The LMES Lessons Learned Program Manager was proactive in disseminating lessons learned information regarding the recent fatality at the Idaho National Engineering and Environmental Laboratory (INEEL) due to the inadvertent activation of the carbon dioxide fire suppression system.

However, there were varied interpretations on how issues should be managed. Once again, a key factor in how rigorously an issue was managed depends on whether the issue was identified by an internal or external organization. Clearly, issues identified by an external organization (e.g., DOE, State or Federal regulators, the LMES Quality Services Organization) are managed, analyzed, and tracked differently than issues identified internally through management assessments. The issue coordinators for DUO and DSO clearly confirmed this. Issues identified during management assessments are not risk ranked per ESS-MS-131, root cause analysis is not performed, and independent verification is not required. Management assessment issues are tracked as “management commitments” in ESAMs.

Two noteworthy practices regarding issues management were the use of management reviews by the Nuclear Operations Organization and the Y-12 Plant Year 2000 (Y2K) initiative.

Management reviews are performed for those events that do not require formal notification under the DOE occurrence reporting system. Management reviews are described in Chapter 6 of the *Nuclear Operations Conduct of Operations Manual*. Chapter 6 provides for compensatory measures, root cause determination, and lessons learned. DUO and DSO have performed numerous management reviews within the past 3 months. This is a commendable practice, which may be beneficial throughout the LMES organization (MG2-1).

The Y-12 Plant is actively working on the Y2K problem. A project team, led by the Y-12 Plant Site Management Services Manager, is collecting and correlating the initial inputs from the facilities and buildings. Business systems as well as process systems are included in this initiative. The Y-12 Plant is developing the action plan to verify the survey results and address the problems. The plan will include additional testing to identify the problems and to validate the solutions. It is anticipated that the ESG will be briefed concerning the project within the next month. This effort has not been directly funded. A funding request for the corrective actions is being developed in parallel with the action plan (MG2-2).

Observations: The Y-12 Plant monthly issues management meeting was attended to observe the interaction between LMES management on issues management. Several performance indicators were reviewed that addressed areas such as percent of overdue issues, the number of rejected corrective action plans, and the timeliness of occurrence reports. A detailed status report on the 30 key issues at the Y-12 Plant was also provided. In addition, the August Central Safety, Health, and Environmental Affairs meeting was observed. The meeting was well attended by personnel throughout the LMES organization. Performance indicators, an ISMS case study, and the recent fatality at INEEL were discussed. Overall, the meeting was productive.

Conclusion: LMES has a documented and implemented assessment program that provides feedback on performance. LMES uses line management assessments, surveillances, and independent assessments to measure performance. However, issues management has several programmatic and implementation weaknesses that need attention.

Issues:

Strengths:

- The use of management reviews by Nuclear Operations is noteworthy. (MG2-1)
- The Y-12 Plant Y2K issue is being actively managed. (MG2-2)

Concerns:

- There are numerous redundant assessment procedures that may lead to confusion regarding reporting requirements and assessor responsibilities. (MG2-3)
- Assessments are not uniformly implemented within all LMES line management organizations. (MG2-4)
- The issues management program lacks clarity and consistency in a number of areas. This includes the lack of management attention in the up-front screening of identified issues for severity (regardless of whether the issue was identified by an internal or external organization), how issues entered into ESAMs as “management commitments” are managed (i.e., prioritization, root cause analysis, independent verification), and a description of the role and function of the Issues Management Prioritization Risk Board. (MG2-5)

Inspector: _____

Team Leader: _____

APPENDIX F

EXAMPLES OF TOPICS ADDRESSED IN ISMS DESCRIPTION DOCUMENTS

Clause 970.5204-2(c) of the Department of Energy Acquisition Regulations (DEAR) requires the contractor to manage and perform work in accordance with a documented Safety Management System. In most instances Department of Energy (DOE) contractors have documented safety management systems in place. The issue that remains is whether these documented systems fulfill all the conditions in the DEAR. Some contractors have found it advantageous to create a new document and incorporate it into their Integrated Safety Management Systems (ISMSs). The function of this new document, which in some cases has been called an ISMS description, is to provide information concerning how the documentation (policies, procedures, manuals of practice, etc.), is used to fulfill all the DEAR requirements. As discussed in Chapter III, there may be a need to revise or provide documentation in addition to an ISMS description document if “gaps” are identified, but a description document appears to be needed in most cases.

Based on experience to date, the ISMS description document provides a road map to the all the other system documentation and also describes roles and responsibilities of the organization in using the documents. This appendix provides several illustrations from description documents that have been reviewed as part of the ISMS reviews at the Savannah River Site (SRS) and at the Y-12 Plant.

1. EXAMPLE FROM SRS

This example illustrates implementation of appropriate hazard controls at various organizational levels. The ISMS should provide a method to implement the controls identified at every level of work and hazard. The methods should ensure that the controls remain in effect so long as the hazard is present. The ISMS should briefly describe a method for translating/transmitting formal control documentation to the working-level (“floor level”) procedures used by workers (see Chapter II, Section 4.3). An ISMS should include processes the contractor and subcontractors will use to implement the controls. Figure F.1 illustrates the applicability of various procedures and documentation that Westinghouse uses to implement necessary controls at the Savannah River Site. Table F.1 provides the list of titles for the Westinghouse documents in Figure F.1.

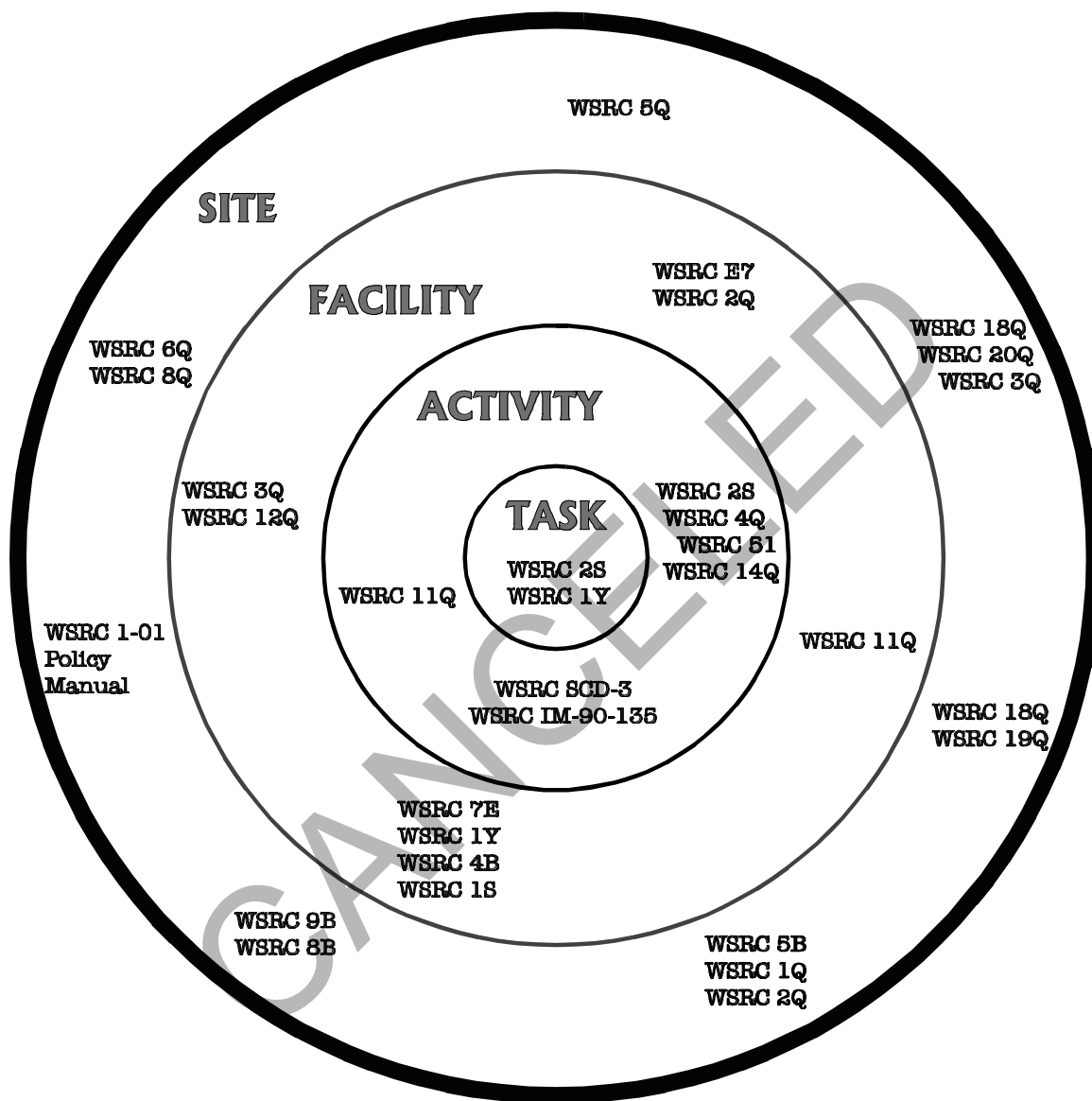


Figure F.1. Example of documentation and procedures to implement the Safety Management System at Westinghouse/Savannah River. (See Table F.1 for document titles.)

Table F.1. Westinghouse/Savannah River SMS Documents	
WSRC No.	Title
1-01	Management Policy Manual
4B	Training and Qualification Manual
5B	HR Policies, Practices, and Procedures
8B	Compliance Assurance Manual
9B	Site Item Reportability and Issue Management
7E	Configuration Management
1Q	Quality Assurance Manual
2Q	Fire Protection Program
3Q	Environmental Compliance Manual
4Q	Industrial Hygiene Manual
5Q	Radiological Control Manual
6Q	Emergency Management Program Procedure Manual
8Q	Employee Safety Manual
11Q	Facility Safety Document Manual
12Q	Assessment Manual
14Q	Material Control and Accountability
18Q	Safe Electrical Practices and Procedures
19Q	Transportation Safety
20Q	Health and Safety for Hazardous Waste Operations
1S	SRS Waste Acceptance Criteria Manual
2S	Conduct of Operations Manual
1Y	Conduct of Maintenance Manual
E7	Conduct of Engineering and Technical Support Procedure Manual
SCD-3	Criticality Safety Manual
IM-90-135	SRS Process Safety Management Manual

2. EXAMPLE FROM THE Y-12 PLANT

This example illustrates an approach to describing the structure of the ISMS in terms of the policies, procedures, and manuals of practice. Figure F.2 provides a top-level summary of the key ISMS implementing documents for site-, facility-, and activity-level processes. This is an alternative way of exhibiting the role of existing safety manuals of practice to that of the five-by-seven matrix discussed in Chapter III. The description of Figure F.2 from the Y-12 Plant ISM System Description is as follows:

2.1 ISMS Infrastructure: An Overview

Figure F.2 illustrates the ISMS infrastructure, showing the key programs that flow requirements from the site to the facility and task levels.

The overall ISMS program at Y-12 is described in procedure Y10-202, *Integrated Safety Management Program*. At the site level, the ISMS begins with the documents that describe the scope of work to be accomplished. DOE defines the site-level scope of work on an annual basis. Priorities are established between DOE Headquarters, local DOE, and the contractor. Production schedules and commitments are formalized in the Management and Operating Contract as Work Authorization Directives. Budgets are developed using estimates generated by the operations line organizations that include the necessary environment, safety, and health (ES&H) resources required to execute the work safely and to maintain the infrastructure of the facilities. This budgeting and contract administration process is defined in draft procedure Y32-100, *Y-12 Plant Budget and Contract Administration*. Appendix B to that procedure includes a detailed description of the business planning, budgeting, and contract administration processes, along with flow charts that summarize the activities involved in planning and budgeting.

The Executive Steering Group (ESG) provides Y-12 Plant policy and strategic planning support, oversight, and direction of the ISMS policies and practices. The ESG is led by the Vice President for Defense Programs responsible for the execution of the business planning and budgeting processes, including the prioritization of tasks and resources in support of the business planning and budget processes. The ESG works with DOE to establish the Contractual Work Authorization Directives, performance metrics, incentive fee criteria, and performance milestones for each budget execution year.

Requirements flow down to the facility level for planning, scheduling, and work execution. At the facility level, the Operations Manager is the line manager responsible to his or her organization and senior line managers for all work conducted in the facility, for the maintenance of the facility safety envelope, and for the protection of the workers, the public, and the environment. The Operations Manager is supported by the Operational Safety Board (OSB), which was established in each nuclear facility in accordance with procedure Y10-202, *Integrated Safety Management Program*. The OSB is the staff of technical, ES&H, and other support organization personnel who are formally assigned to assist the Operations Manager in the evaluation, analysis,

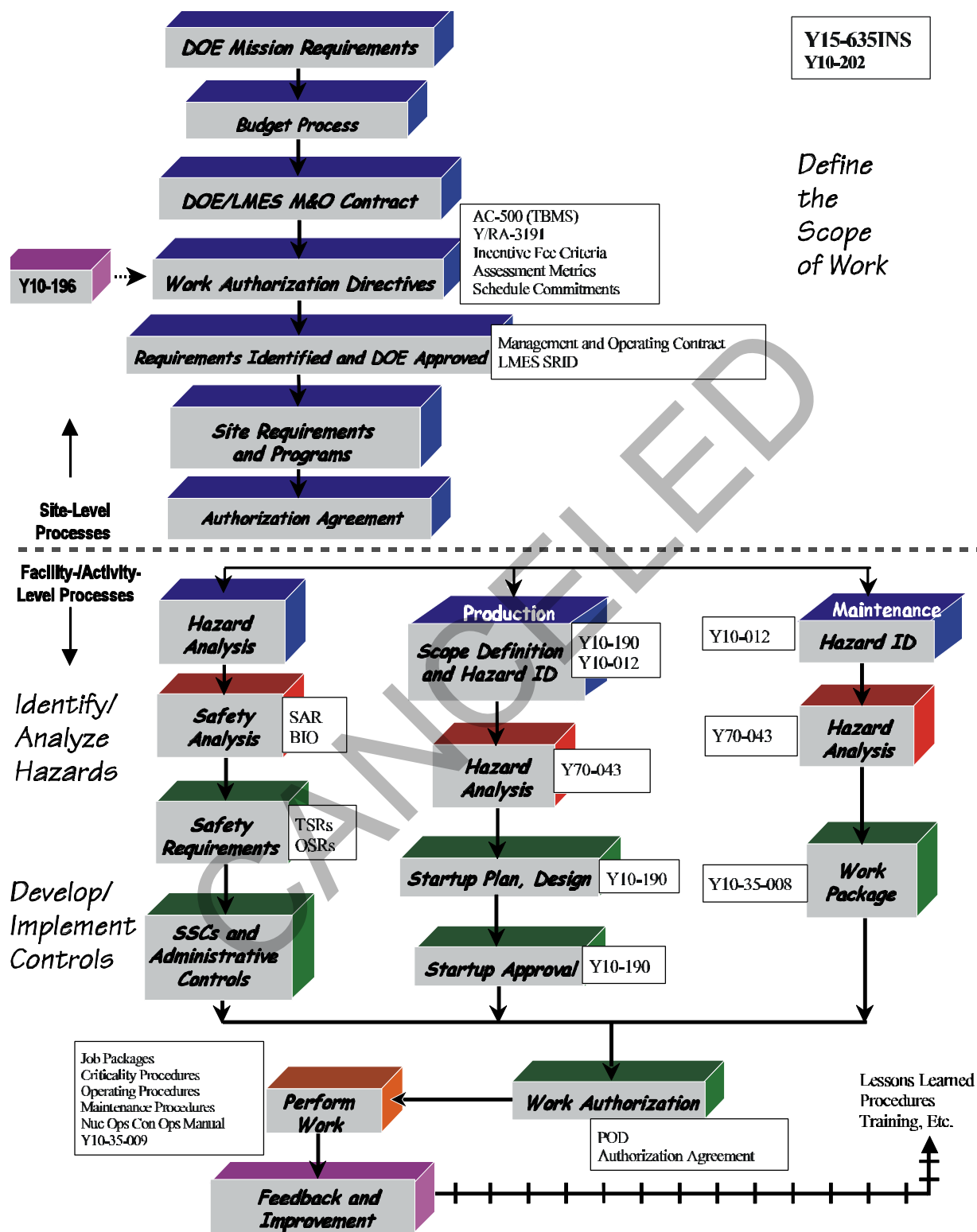


Figure F.2. ISMS Basic Infrastructure.

planning, and oversight of activities in the facility. Core production capabilities and processes are authorized for each nuclear facility through a formal set of documentation that is verified by readiness assessments or operational readiness reviews. These authorized production activities in the facility are documented in the approved basis for interim operation or safety analysis report (SAR) and implemented through the facility's operational safety requirements (OSRs) or technical safety specifications. These documents, along with applicable environmental permits, form the safety envelope of the facility and are codified in the facility's authorization agreement with DOE.

The Operations Manager is responsible at the task level to ensure all activities in the facility are authorized within the safety envelope prior to execution. For the most part, annual production requirements use existing processes and capabilities. However, each new production requirement is evaluated against the approved authorization basis (AB) in accordance with procedure Y10-190, *New Activity Startup Requirements*. The Y10-190 process ensures—

- (1) the work can be performed within the approved AB [if necessary the AB is updated to support the requirements via procedure Y70-809, *Unreviewed Safety Question Determination (USQD)*];
- (2) task-level hazards are identified and analyzed using procedures Y10-012, *Hazard Identification Planning for Maintenance and New Work Tasks* and Y70-043, *Job Hazard Analysis*;
- (3) controls are integrated and implemented prior to startup; and
- (4) procedures are written, training is conducted, and the appropriate level of restart requirement is executed in accordance with procedure Y10-190, *New Activity Startup Requirements*.

Occasionally, production requirements introduce a new capability that is not included in the approved AB (for example, a new type of laser cutting technology) or a change to existing facility structures, systems, and components (SSCs) is necessary. These result in process development, engineering, design, installation, and testing before the new process or facility modification is analyzed, incorporated into the facility's AB, and accepted by Operations. Any change to the facility, regardless of whether it is a modification to an existing SSC or a new process startup, undergoes the same programmatic life cycle, which is governed by formal engineering procedures. This life cycle incorporates reviews and inputs from production subject matter experts and appropriate ES&H support personnel to ensure safety controls are designed into the final product.

Changes to existing SSCs are initiated through procedure Y10-012, *Hazard Identification Planning for Maintenance and New Work Tasks*, which in turn invokes procedure Y10-187, *Change Control Process*. From within the change control process, the detailed scope of work is transmitted to the Central Engineering organization using procedures EP-B-03, *Engineering Service Order*, and EP-DC3-01, *Design Criteria*. These procedures, in turn, invoke the appropriate engineering procedures for—

- defining the requirements (EP-E-05, *System Requirements Document*),
- identifying hazards (EP-DC3-05, *Design Checklists*),
- performing design (EP-C-20, *Design Analysis and Calculations*; EP-C-02, *Squad Checks for Design Drawings*),
- analyzing hazards and ensuring appropriate controls are built into the design (EP-E-07, *Safety Review and Documentation*; EP-E-19, *Criticality Safety*; EP-C-17, *Design Verification*), and
- obtaining approval of the design by the customer (EP-DC2-04, *Design Process Interface for Minor Modifications*; EP-DC2-05, *Design Process Interface for Minor Construction Modifications*).

Once the design is completed and approved, depending on whether it is a construction installation or a maintenance installation, the hazards associated with the installation and testing are identified and analyzed and appropriate controls are implemented. If the design is a construction installation, procedures EP-CC3-04, *Construction Safety and Health Work Requirements*, EP-CC3-04-01, *Safety and Health Work Requirements and Checklist*, and EP-CC3-04-02, *Field Activity Exceptional Hazard Assessment Checklist*, are used to identify, analyze, and control the hazards associated with the installation. If the design is a maintenance installation, procedure Y10-012 is again invoked to identify the hazards associated with the installation activities. Procedure Y70-043, *Job Hazard Analysis*, is then used to analyze the hazards so that controls can be identified and implemented using procedure Y10-35-008, *Maintenance Planner's Guide*.

If the activity is a new process under the control of procedure Y10-190, a project team is initiated using procedure EG-A-06, *Project Team Organization and Responsibilities*. The scope of work is transmitted to the design organization using procedures EP-DC3-01 and EP-E-05. Design is generated and hazards are identified and analyzed using procedures EP-C-20, EP-C-02, EP-E-07, EP-E-19, and EP-C-17. Since most new design is installed by the construction organization, EP-CC3-04, EP-CC3-04-01, and EP-CC3-04-02 are used to identify, analyze, and control the hazards associated with the installation. Acceptance of the design and installation is accomplished using procedure EP-E-20, *Operational Readiness Process*, and turnover and operation by the customer follows the guidance in Y10-190.

The other major component of work at the facility and task levels is maintenance work. The scope of the work is defined and the hazards are identified using procedure Y10-012, *Hazard Identification Planning for Maintenance and New Work Tasks*. Execution of this procedure determines the level of planning required for the task, based on the hazards identified as well as the function of the equipment to be serviced. Maintenance work packages are prepared in accordance with Y10-35-008, *Maintenance Planners Guide*, and approved by the responsible line manager. The Operations Manager (assisted by the OSB) is responsible for ensuring that maintenance work is properly planned; controls are integrated and implemented to protect the

workers, the public, and the environment; and work is authorized and executed within the approved safety envelope.

Work is authorized and scheduled to be performed by means of the facility “plan of the day.” Work is executed in the nuclear facilities in accordance with the *Nuclear Operations Conduct of Operations Manual*.

Improvements in the assessment and feedback programs have focused in the near-term on the management self-assessment program (MSA) and on the use of management critiques and reviews. The MSA program is being restructured with an emphasis on performing operational assessments using operations line managers, increasing organization and senior managers’ time in the facility, and improving the follow-up and corrective actions when issues are identified.

2.2 Details of the ISMS Structure

The Y-12 Plant ISMS description addresses the next level of detail by organizing the applicable ISMS mechanisms (policies, procedures, processes, and manuals of practice) as they relate to ISMS core functions. Specifically, the site-level mechanisms are listed in Table F.2 and the facility- and activity-level mechanisms are listed in Table F.3. Although the approach of identifying applicable mechanisms for each core function and for each organizational level leads to some duplication, the approach provides a useful structure that can be related directly to the requirements of the DEAR.

Table F.2. Site-Level ISM Mechanisms

Define Scope	<ul style="list-style-type: none"> * Y10-36-001, LMES Budgeting and Cost Control * Directive Work Schedule and Defense Programs Strategic Plan * DOE Orders * Incentive Fee Criteria, Assessment Metrics, and Schedule Commitments * LMES Management and Operating Contract * Y-12 Plant Standards/Requirements Identification Document * AL56XB, Rev. 1 * AC-500, Task-Based Management System * EP-E-01, Systems Engineering * ESS-CM-101, Configuration Management * ESS-CS-101, Nuclear Criticality Safety Program Elements * ESS-EM-101, Emergency Management Program Administration * ESS-SP-101, Environmental Protection Program * FS-103PD, Safety Documentation * OP-101, Conduct of Operations Program Procedure * RP-113, Radiation Protection Program * Y72-001, Environmental, Safety, and Health Activities * SH-152PD, Occupational Safety and Health Program * Y73-171PD, Construction Safety and Health Management Program * Y/AD-635, Y-12 Plant Integrated Safety Management System * Y/RA-3191 * Y10-202, Integrated Safety Management Program * Y70-100, Y-12 Plant Radiological Control Program * EP401099/B, Product Realization Process * TBP-000, Program Management * TBP-PRP, Product Realization Process
Identify/Analyze Hazards	<ul style="list-style-type: none"> * ES/CSET-2, Hazard Identification and Facility Classification Application Guide * ESS-CS-101, Nuclear Criticality Safety Program Elements * ESS-CS-102, Nuclear Criticality Safety Approval * ESS-EM-103, Environmental Hazard and Consequence Analysis * FP-105PD, Fire Protection Program * FS-103PD, Safety Documentation * PC-164PD, Service Contract Safety and Health Program * Y73-171PD, Construction Safety and Health Management Program * Y70-134, Y-12 Plant ALARA Program for Rad Protection * Y70-150, Nuclear Criticality Safety Program * TBP-900, Nuclear Explosive and Weapon Safety
Develop/Implement Controls	<ul style="list-style-type: none"> * EP-E-01, Systems Engineering * EP-E-02, Engineering Configuration Management Program * ESS-CM-101, Configuration Management * ESS-CS-101, Nuclear Criticality Safety Program Elements * FP-105PD, Fire Protection Program * FS-103PD, Safety Documentation * Y/DQ-61, Rad Con Manual * Environmental Permits

Table F-3. Facility- and Activity-Level ISM Mechanisms	
Define Scope	<ul style="list-style-type: none"> * Authorization Agreements * BIOs and SARs * EP-E-05, System Requirements Documents * EP-E-19, Criticality Safety * Y10-012, Hazard Identification Planning for Maintenance and New Work Tasks * Y10-103, Writer's Guide for Y-12 Plant Technical Procedures * Y10-190, New Activity Startup Requirements
Identify/Analyze Hazards	<ul style="list-style-type: none"> * BIOs and SARs * CM-43, Functional Classification of SSCs * DOE Order 3011 * DOE Order 6430.1A * Environmental Permits * Process Hazards Analyses (PHAs) * Criticality Safety Evaluations (CSEs) * EP-DC3-12, Equivalency Evaluation Process * EP-E-07, Safety Review and Documentation * ESS-CS-103, Criticality Safety Calculations * Y/DQ-61, Rad Con Manual * Y10-012, Hazard Identification Planning for Maintenance and New Work Tasks * Y70-043, Job Hazard Analysis * Y10-103, Writer's Guide for Y-12 Plant Technical Procedures * Y10-190, New Activity Startup Requirements * Y10-198, AB Update Preparation, Review, Approval, and Issuance * Y70-150, Nuclear Criticality Safety Program * Y70-160, Criticality Safety Approval System * Y70-809, Unreviewed Safety Questions * Y75-122, Rad Worker Permits * Y10-187, Integrated Safety and Change Control Process
Develop/Implement Controls	<ul style="list-style-type: none"> * Facility BIOs or FSARs * Facility OSRs or TSRs * Job Permits * Surveillance and Test Procedures * EP-DC3-05, Design Checklists * EP-E-20, Operational Readiness Process * Y73-107, Lockout/Tagout * Y10-027, Plant Conduct of Training Procedure * Y10-039, Field Calibration Program * Y10-102, Technical Procedure Process Control * Y10-103, Writer's Guide for Y-12 Plant Technical Procedures * Y10-153, Temporary Modification Control * Y10-187, Integrated Safety and Change Control Process * Y10-190, New Activity Startup Requirements * Y10-194, Preventive Maintenance Program * Y10-35-004, Executing Maintenance Jobs

Table F-3. Facility- and Activity-Level ISM Mechanisms (continued)	
Develop/Implement controls (continued)	<ul style="list-style-type: none"> * Y10-35-008, Work Planner's Guide * Y10-35-0204, Executing Post Maintenance Testing * Y70-809, Unreviewed Safety Questions * Y75-122, Rad Worker Permits * Criticality Safety Analyses (CSAs) * Y70-810, Flowdown of OSR/TSR Requirements
Perform Work	<ul style="list-style-type: none"> * Job Packages * Criticality Control Procedures * Operating Procedures * Maintenance Procedures * Nuclear Operations Conduct of Operations Manual * OSB Charters * Y10-35-009, Supervisor's Guide * QA-912, ORRs and RAs * Y75-122, Rad Worker Permits * Authorization Agreements
Feedback	<ul style="list-style-type: none"> * QA-301, Control of Nonconforming Items * QA-312, Issues Management * QA-331, Lessons Learned * QA-551, Stop Work * QA-901, Independent Assessments * QA-904, Surveillance * QA-911, Management Assessments * QA-912, ORRs and RAs * RP-113, Radiation Protection Program * Y60-024, Y-12 Plant Readiness Assessment Program * Y60-028, Y-12 Plant Management Assessment Program * Y70-134, Y-12 Plant ALARA Program for Rad Protection