INTEGRATED SAFETY MANAGEMENT SYSTEM DESCRIPTION

U.S. DEPARTMENT OF ENERGY
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ACRONYMS

ALARA	As Low as Reasonable Achievable
AMEM	Assistant Manager for Enviroronmental Management
CAIRS	Computerized Accident Incident Reporting System
CD	Critical Decision (document)
CFR	Code of Federal Regulations
CIH	Certified Industrial Hygienist
CHP	Certified Health Physicist
COO	Chief Operations Officer
COOP	Continuity of Operations
CSP	Certified Safety Professionals
DART	Days Away Restricted or on Job Transfer
DAS	Deputy Assistant Secretary
D&D	Decontamination and Decommissioning
DEAR	U.S. Department of Energy Acquisition Regulation
DNFSB	Defense Nuclear Facilities Safety Board
DOE	U.S. Department of Energy
DPO	Differing Professional Opinion
DSA	Documented Safety Analysis
ECP	Employee Concerns Program
EM	U.S. Department of Energy Office of Environmental Management
EMAAB	EM Acquisition Advisory Board
EMS	Environmental Management System
ES&H	Environment, Safety, and Health
FEOSH	Federal Employee Occupational Safety and Health
FR	Facility Representative
FRA	Functions, Responsibilities, and Authorities
FRAM	Safety Management Functions, Responsibilities, and Authorities Manual
FTCP	Federal Technical Capabilities Program
HQ	Headquarters
HR	Human Resources
IDP	Individual development plan
IPP	Individual performance plan
ISM	Integrated Safety Management
ISMS	Integrated Safety Management System
ISMSD	Integrated Safety Management System Description
LFRG	Low-Level Waste Disposal Facility Federal Review Group
LL	Lessons Learned
LM	Office of Legacy Management
MIMS	Manifest Information Management System
MOA	Memorandum of agreement
NEPA	National Environmental Policy Act
OPI	Office of Primary Interest
OS/IH	Occupational Safety/Industrial Hygiene
ORPS	Occurrence Reporting and Processing System

PAAA	Price Anderson Amendment Act
PBI	performance baseline incentive
PD	position description
PE	Professional Engineer
POMC	Performance objectives, measures and commitments
PSO	Program Secretarial Office
QAP	Quality Assurance Program
QPR	Quarterly Performance Review
RFP	Request for Proposal
SEB	Source evaluation board
SER	Safety evaluation report
SME	Subject matter expert
S/R	Standards/Requirements
S/RID	Standards/Requirements Identification Document
SSIMS	Safeguards and Security Information and Management System (SSIMS)
STSM	Senior Technical Safety Manager
TQP	Technical Qualification Program
TRC	Total Recordable Cases
TRU FRG	Transuranic Waste Federal Review Group
TSR	technical safety requirement
USQ	Unreviewed safety question
WP/C	Work Planning and Control

EXECUTIVE SUMMARY

This Integrated Safety Management (ISM) System Description (ISMSD) defines how the U.S. Department of Energy (DOE) Office of Environmental Management (EM) integrates environment, safety, and health requirements and controls into Federal work activities, and oversees implementation of ISM within EM federal and contractor activities. It explains our safety values, objectives and approach for ensuring protection to the public, worker and the environment, consistent with DOE Policy 450.4, *Safety Management System Policy*. The ISMSD describes how EM conducts work following the seven ISM Guiding Principles, the five ISM core functions, and also incorporates the four supplemental safety culture elements from DOE Implementation Plan to Improve Oversight of Nuclear Operations (in response to Defense Nuclear Facilities Safety Board Recommendation 2004-1), dated October 2006. Finally, this document establishes the EM Headquarters expectations for establishing and maintaining a safety conscious work environment at all level within the organization. The following are the EM Headquarters safety expectations for all work performed at EM sites

Safety is first – it overrides every other priority

- Safety is the dominant characteristic and value of EM. The ability to perform a job safety within EM will not be compromised by production, budget, or schedule priorities. If a job cannot be performed safely it will not be performed.
- Safety drives how we do business. The DOE ISM is a systematic approach for selecting and incorporating the appropriate safety standards, necessary work controls, and expectation of continuous feedback/improvement. EM federal and contractor employees will not accept shortcuts which circumvent safety or yield less than quality results. This systematic approach motivates a culture of personal responsibility by and for each employee.

The EM safety culture is founded on the following principles and values:

- An environment where each employee instinctively feels responsible for safety,
- Leaders demonstrate commitment to safety,
- Trust towards each other is a signature of the organization,
- Decision-making ensures safety,
- An inquisitive attitude and behavior towards challenging assumptions and considering potential adverse consequences of planned actions,
- A disciplined safety (authorization) basis system is essential to ensuring all hazards are identified and addressed before work begins,
- Organizational learning is embraced, and
- Openly examining operations and soliciting feedback from external resources.

EM offers a work environment which fosters and encourages an open exchange of ideas. This includes raising safety concerns or differing opinions without fear of retaliation. It is fully expected that EM staff members will raise safety issues and provide feedback for improving work processes.

EM workers are expected to protect themselves and others against accidents. All accidents and incidents are preventable. An accident-free workplace is achieved through careful planning, close attention to hazard controls, worker involvement in task planning, and stopping work in the face of uncertainty. EM staff maintains a high standard of excellence for the organization and nuclear operations. EM management will continue to promote safety throughout the work environment.

INTRODUCTION

The mission of the Office of Environmental Management (EM) is the reduction of risk and cleanup of the environmental legacy of the nation's nuclear weapons program and government-sponsored nuclear energy research. The program is one of the largest and most diverse and technically complex environmental cleanup programs in the world and includes responsibility for the cleanup of over 100 sites across the country. Included in that responsibility is the need to:

- Safely disposition nuclear waste and materials;
- Safeguard materials that could be used in nuclear weapons;
- Deactivate and decommission several thousand contaminated facilities no longer needed to support the Department's mission; and
- Remediation of surface and subsurface soils, and groundwater contaminated with radioactive and hazardous wastes.

EM is committed to fulfilling this complex and hazardous mission in a manner that affords maximum protection of the public, our Federal, contractor, and subcontractor workers, and the environment. EM is fully dedicated to performing its mission in compliance with the protective statutes enacted by Congress for protection of workers, the public and the environment, and for exercising good stewardship of public property. This protection is effected at all levels (site, facility, task and activity) by insisting on and routinely verifying that mission work is conducted following the five Integrated Safety Management (ISM) Core Functions established in DOE Policy 450.4, *Safety Management System Policy,* in a manner that is consistent with and satisfies the seven ISM Guiding Principles also established in DOE P 450.4.

This ISM System Description describes EM Headquarters' (EM-HQ) Federal processes for planning, approving, overseeing, and improving the safe conduct of work as required by DOE P 450.4. This document also integrates the four supplemental safety culture elements from the DOE 2004-1 Implementation Plan with the existing seven guiding principles. Finally, this document establishes the expectations of the Assistant Secretary for Environmental Management (EM-1) for maintaining a safety conscious work environment.

This System Description has the following three focus areas: (1) defines the EM-HQ management systems to identify ISM execution; (2) describes the EM-HQ Federal staff work activities within the ISM envelope; and (3) describes how EM-HQ measures ISM effectiveness.

1.0 PURPOSE AND OBJECTIVE

The purpose of the EM mission is to improve the environment at Federal facilities and other formerly used properties under DOE cognizance and reduce risk to public health. The purpose of this document is to describe EM-HQ responsibilities for, and the approach to, implementing the Integrated Safety Management System (ISMS) Objective, Core Functions, and Guiding Principles established in DOE P 450.4 in all aspects of our work and at all organizational levels. These implementing mechanisms encompass the system of policies, plans, and procedures that establish

the EM-HQ responsibilities and methods for implementing each ISMS Guiding Principle and Core Function. The objective of the EM-HQ ISMS is to systematically integrate safety[1] into management and work practices at all levels, so that the mission is accomplished while protecting the public, workers, and the environment. EM accomplishes this objective through effective integration of safety management into all facets of work planning and execution. EM-HQ management of safety functions and activities is an integral part of mission accomplishment.

2.0 INTEGRATED SAFETY MANAGEMENT SYSTEM (ISMS) OVERVIEW

DOE established the approach to integrating safety into all aspects of work at its facilities in DOE P 450.4. This Policy describes the safety management system as consisting of six components: 1) the objective, 2) Guiding Principles, 3) Core Functions, 4) mechanisms, 5) responsibilities, and 6) implementation (See figure 1). The objective, Guiding Principles, and Core Functions of safety management are used consistently in implementing safety management throughout the DOE complex and are described in the following sections. The mechanisms, responsibilities, and implementation components are unique to the organization that owns the System, and are established according to the type of work and hazards associated with that work. EM-HQ ISMS mechanisms, responsibilities, and implementation components are fully described in Section 6.

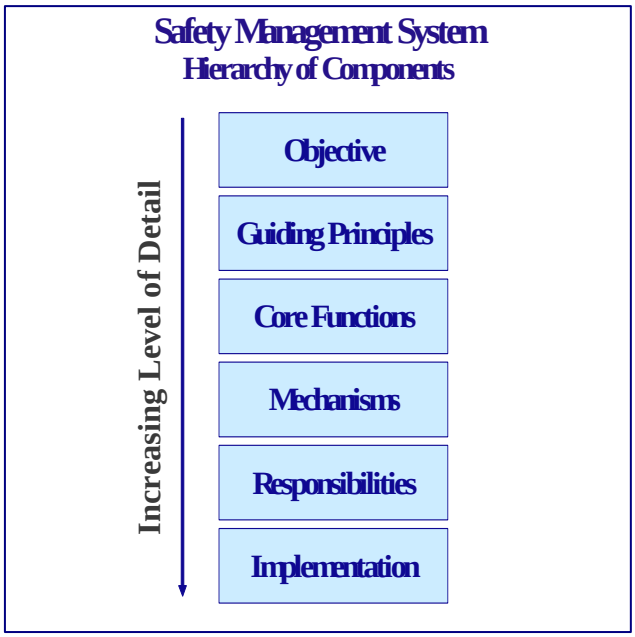

FIGURE 1. ISMS COMPONENTS

2.1 Safety Management Guiding Principles

Figure 2 provides an overview of the ISM Guiding Principles and Core Functions.
The following Guiding Principles are fundamental policies that guide EM-HQ actions, from development of plans and procedures to conduct of work:

1. Line Management Responsibility for Safety: Line Management is responsible and accountable for protection of the public, workers, and the environment;
2. Clear Roles and Responsibilities: Clear and unambiguous lines of authority and responsibility for ensuring safety is documented, communicated, and maintained;
3. Competence Commensurate with Responsibilities: Personnel possess the experience, knowledge, skills, and abilities necessary to discharge their responsibilities;

[1] Safety, as used throughout this Description, encompasses protection of the public, the worker, and the environment. It also comprises all safety, health and environmental disciplines, i.e., radiation protection, fire protection, nuclear safety, nuclear criticality safety, environmental protection, waste management, environmental management, industrial hygiene, and industrial safety.

4. Balanced Priorities: Resources are effectively allocated to address safety and programmatic and operational considerations. Protecting the public, workers, and the environment is a overriding priority;
5. Identification of Safety Standards/Requirements (S/R): Before work is performed, the associated hazards shall be evaluated, and an agreed-upon set of safety S/R are established, which provide adequate assurance that the public, workers, and the environment are protected from adverse consequences;
6. Hazard Controls Tailored to Work Being Performed: Administrative and engineering controls to prevent and mitigate hazards are tailored to the work and associated hazards; and
7. Operations Authorization: The conditions and requirements for operations to be initiated and conducted are agreed upon and clearly established.

Based on over ten years of experience with developing and implementing ISMS programs across the complex, the Department has established the following four supplemental safety culture elements to be used in concert with ISM guiding principles to enhance the effective implementation of ISMS. These include:

1. Individual Attitude and Responsibility for Safety: Every individual accepts responsibility for safe mission performance. Individuals demonstrate a questioning attitude by challenging assumptions, investigating anomalies, and considering potential adverse consequences of planned actions. All employees are mindful of work conditions that may impact safety, and assist each other in preventing unsafe acts or behaviors.

FIGURE 2. ISMS GUIDING PRINCIPLES AND CORE FUNCTIONS

2. Operational Excellence: Organizations achieve sustained, high levels of operational performance, encompassing all DOE and contractor activities to meet mission, safety, productivity, quality, environmental, and other objectives. High-reliability is achieved through a focus on operations, quality decision-making, open-communications, deference to expertise, and systematic approaches to eliminate or mitigate error-likely situations.

3. Oversight for Performance Assurance: Competent, robust, periodic and independent oversight is an essential source of feedback that verifies expectations are being met and identifies opportunities for improvement. Performance assurance activities verify whether standards and requirements are being met. Performance assurance through conscious, directed, and independent reviews at all levels brings fresh insights and observations to be considered for continuous safety and performance improvement.

4. Organizational Learning for Performance Improvement: The organization demonstrates excellence in performance monitoring, problem analysis, solution planning, and solution implementation. The organization encourages openness and trust, and cultivates a continual learning environment

2.2 Safety Management Core Functions

The five ISM Core Functions, established in DOE P 450.4, provide the necessary structure for work activity that poses a hazard to the public, workers, and the environment. The Functions are applied as a continual cycle, with the degree of rigor appropriate to control the work hazards. The five Core Functions upon which the EM-HQ ISMS is developed are:

1. Define the Scope of Work: Missions are translated into work, expectations are set, tasks are identified and prioritized, and resources are allocated;
2. Analyze the Hazards: Hazards associated with the work are identified, analyzed, and categorized;
3. Develop and Implement Hazard Controls: Applicable S/R are identified and agreed upon, controls to prevent/mitigate hazards are identified, the safety envelope is established, and controls are implemented;
4. Perform Work within Controls: Readiness is confirmed and work is performed safely; and
5. Provide Feedback and Continuous Improvement: Feedback information on the adequacy of controls is gathered, opportunities for improving the definition and planning of work are identified and implemented, line and independent oversight is conducted and, if necessary, regulatory enforcement actions occur.

2.3 Responsibilities for Safety Management

The EM safety management responsibilities are defined in DOE M 411.1-1C, *Safety Management Functions, Responsibilities, and Authorities Manual* (FRAM); *DOE Office of Environmental Management Safety Management Functions, Responsibilities, and Authorities (FRA) Document*; and Section 6.0 of this System Description. Additional responsibilities for EM HQ Federal workers are included the EM FRA and in the DOE HQ O 442.1, *Headquarters Occupational Safety and Health Program.*

2.4 Implementation of Safety Management

Section 6.0 specifies safety implementation actions, performance objectives, measures and commitments (POMC), systems, and attributes.

3.0 EM MANAGEMENT COMMITMENTS AND EXPECTATIONS

A strong safety culture is highly dependent on a learning environment. EM operates multiple learning and communication processes to capture and share project and safety knowledge. The EM safety and learning culture has three distinctive elements:

1. Organizational safety culture – The sum of the organizations knowledge and ability to learn in support of the mission.
2. Nuclear safety culture – EM's behaviors and values making safety its overriding priority.
3. Worker safety culture – A safety conscious work environment where workers raise issues without fear of reprisal.

Good leadership and a culture of trust throughout the organization are key ingredients for an open learning atmosphere. EM's safety culture represents the sum of the organization's learning as it deals with lessons learned, assessments, issues, and continuous improvement. Section 6.0 of this System Description shows how EM Headquarters (HQ) utilizes its management systems to leverage learning and knowledge throughout the entire EM complex.

The EM HQ management team establishes and implements management systems that ensure work is performed safely at all sites, by both Federal and contractor staff, in a safety conscious work environment. The EM HQ management team insists on a "Zero Incident Policy," and strives to control hazards by pledging the following:

EM will continue to maintain the highest safety standards for all the work it performs.

- To "lead by example" by placing "safety first" at all times to achieve a safety conscious work environment and incident-free workplace;
- To recognize safety is a collective responsibility and each HQ and site manager must create an atmosphere where each worker has a personal responsibility for improving work processes;
- To define clear roles, responsibilities, and authorities between all headquarters' and field organizations;
- To be self-critical, perform self-assessments, and solicit external feedback to achieve continuous improvement;
- Ensure technical capabilities are in place throughout the complex to fulfill safety responsibilities;
- To establish effective Performance Objectives, Measures and Commitments (POMCs) used to monitor and evaluate actual performance against the performance objectives;
- To maintain a lessons-learned and operating experience program, and to continually learn from experience;
- To monitor and assess safety performance, and require the completion of corrective actions in a timely manner;
- To ensure all senior HQ and field management are committed to safety and demonstrate a zero-incident safety culture; and

- To respect a clean, healthy environment and require environmental considerations (understanding the impact of an action to the environment) to be an integral part of our mission.

The following are management's safety expectations for each Federal headquarters' employee:

- To maintain a questioning and inquisitive attitude;
- To have a willingness to pause, ask questions, gather additional data, and obtain answers, rather than proceed in the face of uncertainty;
- To raise concerns and issues directly to management;
- To make decisions that consider safety before production, cost, and schedule;
- To perform oversight to strengthen safety and improve performance; and
- To achieve excellence and not be complacent with meeting minimal compliant standards.

4.0 SAFETY PERFORMANCE OBJECTIVES, MEASURES AND COMMITMENTS

EM measures safety performance by evaluating against rigorous safety objectives and goals. We evaluate safety performance results against baseline objectives to determine the success of our safety culture. EM develops indicators to measure the effectiveness of its management systems. The following are some examples of the objectives and measures used by EM to monitor its management systems:

- EM FRA is updated as required;
- EM management will ensure acquisitions incorporate relevant safety requirements;
- Annually update EM ISMSD;
- Individual Performance Plans (IPPs), Individual Development Plans (IDPs) and Position Descriptions (PDs) are reviewed and revised annually;
- 90% or greater of planned employee training is completed on schedule;
- Delegations of authority are reviewed (as necessary);
- EM management will adjust budget priorities to address safety concerns (as necessary); and
- EM work is completed per planned commitments.

All POMCs applicable to the ISM Guiding Principles are discussed in Section 6.0.

EM contractors track their safety performance against prescribed safety measures. EM contractors are also responsible for flowing down safety requirements to their subcontractors. Safety events and statistics are reported to DOE corporate information systems where EM-HQ monitors performance.

Some of the types of indicators tracked through the Occurrence Reporting and Processing System (ORPS) and the Computerized Accident Incident Reporting System (CAIRS) by headquarters to monitor safety performance include:

EM Safety Performance Indicators

- SIGNIFICANT INJURIES,
- NEAR MISSES,
- INDUSTRIAL OPERATIONS,
- OCCUPATIONAL SAFETY/INDUSTRIAL HYGIENE (OS/IH),
- FIRE PROTECTION,
- ELECTRICAL,
- AUTHORIZATION BASIS,
- NUCLEAR CRITICALITY,
- RADIOLOGICAL CONTROL,
- CONDUCT OF OPERATIONS,
- QUALITY ASSURANCE PROFILE,
- EQUIPMENT DEGRADATION/FAILURE,
- ENVIRONMENTAL RELEASE,
- TOTAL RECORDABLE CASES (TRC) RATE,
- DAYS AWAY RESTRICTED OR ON JOB TRANSFER (DART) CASE RATE, AND
- EM ORPS NORMALIZATION CHARTING USING EVMS.

EM occurrences are monitored on a daily basis through the EM Event Notification System, the Occurrence Reporting and Processing System (ORPS), and periodic phone conversations into Plan of the Day meetings. Events are compiled on a weekly basis and reported to the Assistant Secretary (EM-1). Monthly and quarterly reports are also provided.

Some of the above indices data are normalized for tracking against historical performance. Normalization provides the following benefits:

- Places organizations on a common basis – accounts for size of effort and incorporates occurrence severity;
- Allows comparison of safety performance site by site, by contractor, and corporately where data is available; and
- Normalization can identify areas of needed improvement that may not otherwise be visible -- by making comparisons to a PSO overall performance or a site's specific performance.

5.0 ROLES AND RESPONSIBILITIES

The Assistant Secretary of Environmental Management (EM-1) has the ultimate responsibility for safety within EM. EM-1 with the support of the Chief Operations Officer (COO) and the DAS for

Office of Safety Management and Operation (EM-60) establishes the guidance for the development of EM safety objectives, expectations, commitments, and overall safety culture. EM-HQ safety responsibilities are clearly defined in the EM-HQ FRA Document. The EM-HQ FRA can be viewed on the EM Portal at https://edoe.doe.gov/portal/server.pt.

The EM-HQ FRA details essential safety management functions and clearly establishes EM-HQ lead roles, responsibilities, and authorities for execution of authorized work. Though all offices and employees within EM have some responsibility for implementing safety, figure 1 shows those organizations in red that have the primary responsibility for implementing safety within EM:

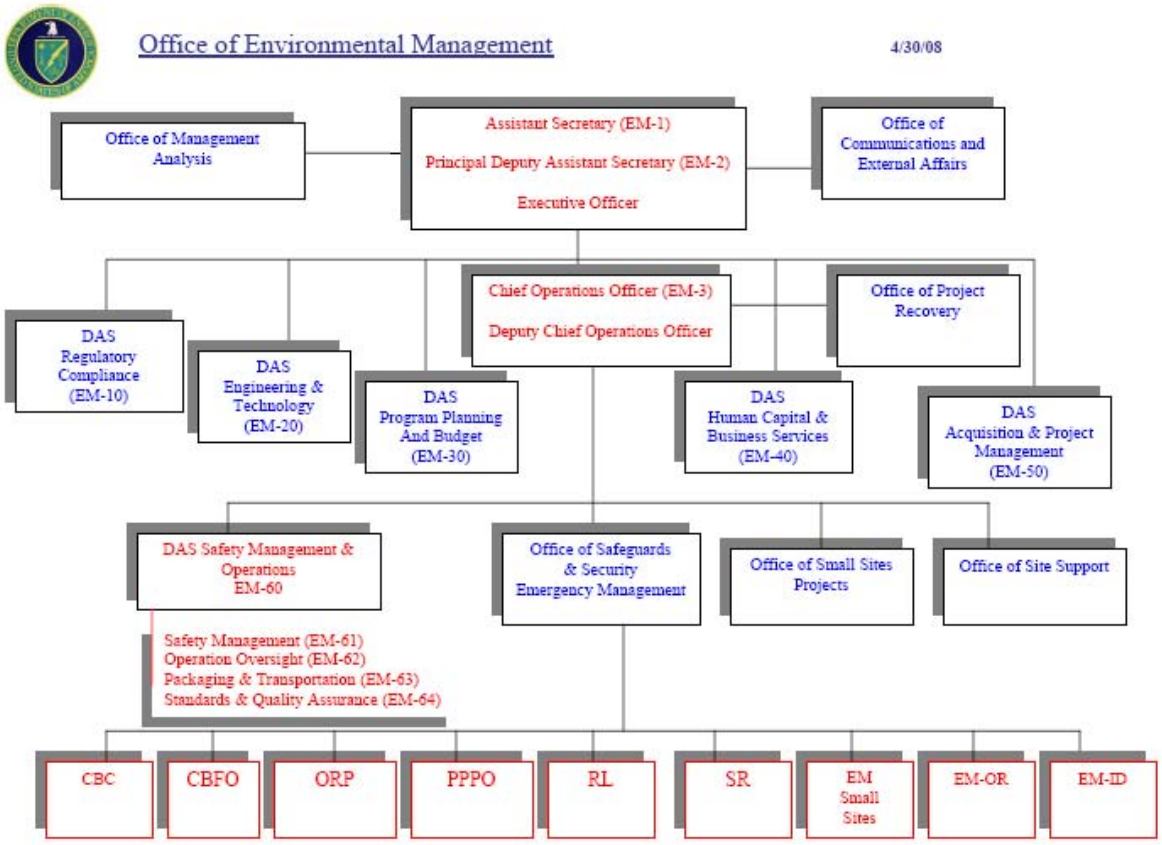

FIGURE 3. EM-HQ SAFETY RESPONSIBILITIES

- Assistant Secretary of Environmental Management (EM-1) establishes the overall EM safety culture.
- EM-1 has the ultimate responsibility for safety within EM. EM-1 with the support of the Chief Operations Officer (COO) and the DAS for the Office of Safety Management and Operation (EM-60) establishes guidance, safety objectives, expectations and commitments to achieve this goal.
- The COO, with the support of EM-60 provides direction and oversight of the management of the ES&H programs at EM sites.

- EM-60 performs programmatic assessments of EM federal and contractor organizations ISM programs and provides feedback to EM Field Managers/AMEMs on the effectiveness of their reviews.
- When requested, EM-3/EM-60 provides safety SME support to the field. See section 6.1.3 for the type of SME support that can be obtained.
- The Principal Deputy Assistant Secretary (EM-2) and the DAS for Program Planning and Budget (EM-30) coordinate facilitation of work priorities with EM Field Managers/AMEMs and provide overall budget planning guidance. Assessments of field business systems are conducted to support the line as needed and feedback is provided to EM-1 regarding business systems effectiveness.
- EM-60 is responsible for overseeing safety in the design of capital construction projects.
- EM-60 ensures proper implementation and continual improvement of Integrated Safety Management Systems in the EM complex and serves as a focal point for EM safety standards and policy development, interpretation, and interfaces with internal/external oversight organizations.
- EM-60 monitors and assists with responses to safety issues identified by other organizations such as the General Accounting Office and the DOE Office of the Inspector General and review the final response for consistency with safety objectives, measures and commitments.
- EM-60 serves as the focal point within EM on all Defense Nuclear Facilities Safety Board (DNFSB) related issues and ensures timely and technically sound resolution of its recommendations and concerns.
- EM-60 manages the EM worker and operational safety, health and quality assurance programs such as Conduct of Operations, startup/restart of nuclear facilities, operational readiness reviews, and occurrence reporting information, as well as providing oversight of all EM safety operations.
- EM-60 manages the EM FRA and assessment activities.
- EM-60 coordinates the day-to-day oversight of operational safety issues and field site safety awareness.
- EM-60 reviews/approves safety basis documents, design analyses, and exemption requests from the field offices on nuclear safety design and other nuclear safety management requirements (e.g., fire protection, radiological protection, and safety and health).
- EM-60 reviews/approves quality assurance related documents and exemption requests from the field offices.
- EM-60 ensures proper maintenance and continual improvement of EM Headquarters ISMS description.
- EM-60 develops criteria for the field annual ISMS declarations and assesses them annually.
- EM-60 participates in field ISMS validation reviews.
- EM-60 manages EM/Field safety delegations of authority.

- EM-60 develops, implements, and maintains the EM HQ Quality Assurance Program Plan, provides coordination and ensures the implementation of the QAP in the field and manages and oversees the EM quality assurance program.
- EM-60 ensures the safety of packaging for hazardous materials to support DOE missions across the Complex, as well as EM's accelerated cleanup and closure activities.

EM management provides safety leadership through visible actions such as weekly field managers calls that promote the sharing of specific safety occurrences and their lessons learned; quarterly project progress reviews that incorporate safety performance as a equal indicator to project performance; support of the ISM champions; the review of corporate safety performance at quarterly field managers meetings; weekly and monthly safety progress reports that focus on the safety performance of sites, contractors, and corporate contractors; quarterly employee safety reminders that focus specifically on the EM corporate safety performance; and, quarterly employee messages that incorporate safety.

Federal Work Scope Responsibilities

EM management's role in assuring safety is defined in the mission and function statements of the organization and is carried out by the Federal staff so it is incorporated in all work practices. Examples of Federal work requirements to assure safety is defined and measured in mission activities include:

- Establishing mission priorities and reviewing the mission and mission plans of field elements;
- Prioritizing and acquiring resources and executing contracts;
- Developing annual budgets and reviewing field work priorities;
- Assigning safety management roles, responsibilities, and requirements;
- Establishing a positive safety environment through effective ISM implementation;
- Implementing management systems for Federal operations;
- Reviewing project baseline plans and evaluating cost/schedule performance;
- Developing performance baseline incentives (PBI) for contractor performance;
- Establishing quality program requirements;
- Approving documented safety analysis reports and technical safety requirements; and
- Approving authorization agreements and safety basis;
- Performing operational readiness reviews;
- Performing assessments, self-assessments, and management observations;
- Performing annual ISM effectiveness reviews;
- Reviewing annual field and contractor ISM readiness declarations;
- Performing issues management and overseeing corrective action closure;
- Performing self-assessments; and

- Establishing performance metrics and evaluating the field and contractor safety performance goals.

This System Description serves to facilitate focus on safety management and continual improvement for the Federal staff both at HQ and throughout the EM complex. EM accomplishes safety improvement through effective leadership, training, making safety the central core of organizational actions, and by implementing effective management systems.

6.0 IMPLEMENTATION OF ISM AT EM

This ISMSD provides the systematic integration of safety into work planning throughout the EM complex. EM implements the requirements of ISM through a comprehensive set of policies, project planning, regulations, and contracts. In addition, the safety requirements of DOE P 450.4, *Safety Management System Policy*, and DOE G 450.4-1B, *Integrated Safety Management System Guide for Use with Safety Management System Policies*, flow down and are applied within each prime contract. (Figure 4).

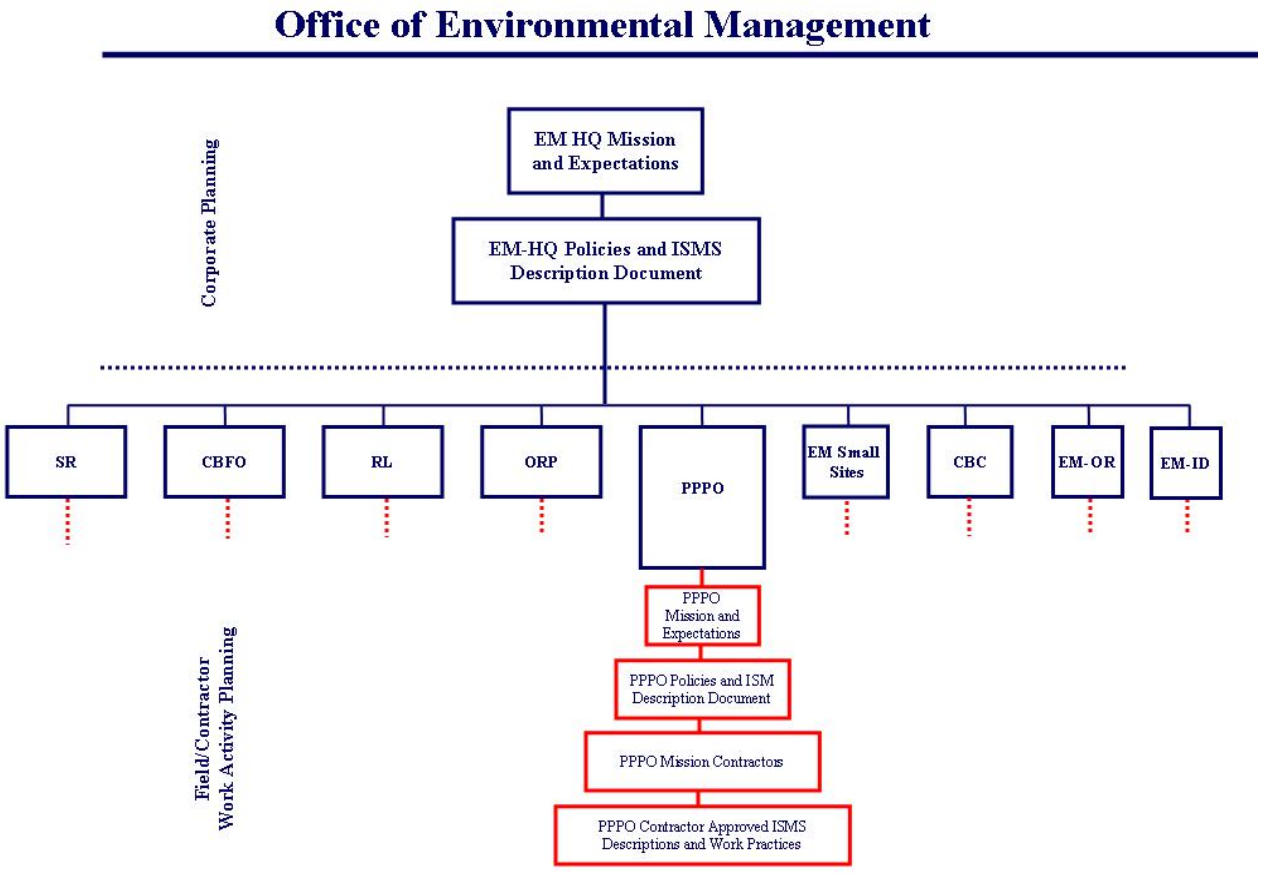

FIGURE 4. EM INTEGRATED ISMS MODEL

6.1 Approach for Executing ISM Principles

The benefit of the 11 ISM principles (seven original plus four supplemental safety culture elements) and five core functions is improved safety awareness and corporate operations. The principles establish an expected set of behaviors and disciplines for eliminating unsafe practices and accidents. Section 7.0 describes the EM implementation of the safety principles and functions, the management systems installed to execute the desired safety, and the expected organizational attributes and outcomes. Each "principle" has an associated implementation discussion using the following template:

- Attributes and Expected Outcomes;
- EM Management Systems Used to Execute Outcomes;
- Applicable Performance Objectives, Measures and Commitments (POMC); and
- EM Policy and Procedural Documents for Each System.

The EM management systems are the primary instrument for implementing the safety principles. The management systems (also referred to as programs) define the practices, techniques, and tools used by EM to meet the project requirements. The EM management systems are "living" and progressive. The systems are adjusted over time to accommodate new requirements, lessons learned, and feedback for improvement. As such, the systems discussed herein are being enhanced along with the ISM System Description. The following is a list of all currently identified EM management systems. The management systems have been grouped into common EM-HQ functional areas to facilitate their assignment to the guiding principles. All of the following functional areas, and therefore management systems, are not discussed in this document. If a functional area is assigned to a guiding principle then all of its associated management systems are also assigned to the guiding principle. The functional areas applicable to the guiding principles are identified in both Table 1 and the remainder of Section 6.

- Safety and Health Management
  - Update of the ISMSD[2]
  - EM FRA
  - Quality Assurance Program (QAP)
  - Safety Occurrence Reporting Management
  - Performance Monitoring and Trending
  - Delegation of Authority
  - Field Managers Call
  - EM Field Managers and Leadership Meetings
  - Issues and Corrective Action Management
  - Safety Basis (or Authorization Basis) Management System
  - Lessons Learned/Operating Experience
  - Price Anderson Amendment Act (PAAA) Coordination
  - Differing Professional Opinion (DPO)
- Assessment and Oversight Program
  - Safety Oversight Program
  - QA Oversight Program
  - Self-Assessment Program
  - Technical Independent Reviews
- Acquisition of Services and Products
  - Review of Acquisition Plans for Safety Implications
  - Review of Requests for Proposals for Safety Implications
  - SEBs
- Project Management Systems
  - Project Controls and Baseline Management
  - Environmental Management Advisory Board
  - Capital Project Initiative to Incorporate Safety Early in Design
  - Construction and Operations Authorizations
  - Quarterly Performance Reviews (QPR)
  - Weekly Project Calls with COO

[2] ISM is designed to be the overarching management system that defines how management systems accomplish the necessary tasks to make ISM function in the organization being described.

- Project Recovery (EM-1.1)
- Project End State (EM project transition to Office of Legacy Management)

- Engineering and Technology Program
  - Project External Technical Reviews
  - Engineering and Technology Funding Request Process
  - Technical Workshop or Exchange Process
  - Property Transfer among program secretarial offices
  - Design Review Process for D&D Projects
  - Review and Approval of Strategic, Business, Infrastructure, Lab Implementation, and other plans
  - Technology Readiness Level Assessments
- Policy Development
- Waste Management Systems
  - LLW Federal Review Group (LFRG)
  - TRU Federal Review Group (TRU FRG)
  - National TRU Program Corporate Board
  - Manifest Information Management System (MIMS)
  - Waste Determination Program Execution Plan
  - DOE-wide Mixed/LLW Calls
  - Weekly DOE-wide Mixed/LLW Call
- Environmental Compliance
  - Environmental Management System
  - National Environmental Policy Act
  - Approval of Program Elements affecting Regulatory Agreements
  - Oversight of Compliance Agreements and Consent Orders
- Transportation Management Systems
  - Office Transportation Incident Process for Hazardous Materials
  - Transportation Post Accident Investigation Process
  - TCAP Transportation Safety and Operations Compliance Assurance Process (TCAP)
  - SARD-1 TCAP- General Management of Transportation and Packaging Programs
  - Hazardous and Radioactive Materials Packaging and Shipping (SARD-2 TCAP, SARD-3 TCAP)
  - Transportation Operations (SARD-4 TCAP, SARD-5 TCAP, SARD-6 TCAP, SARD-7 TCAP, SARD-8 TCAP-HAZMAT)
  - Transportation Risk Management Process

- Contractor Carrier Programs (SOP 001, SOP 002, and SOP 003)
- Office of Transportation Emergency Preparedness Program (TEPP)

- Safeguards and Security
  - Safeguards and Security Information Management System (SSIMS)
- Continuity of Operations (COOP)
  - COOP Manual
- Financial Management
- Information Technology Management
  - Cyber Security
  - Information Enterprise Architecture
  - Information Technology Management
- HR Management System
  - Annual Workforce Planning
  - Skill Gap Analysis/Assessments
  - Hiring Control Process
  - Succession Planning
  - Human Capital Management
  - Training/Employee Development
  - Federal Technical Capability Program
  - Leadership Development
  - Employee Concerns Program
  - Competency Management Program
  - Employee Communications
  - Directives Management

Table 1 aligns the EM management systems used within this ISMDS to the ISM safety principles. A complete list of EM Management Systems applied to the guiding principles, along with their performance measures, is provided in Appendix A.

In addition to the management systems, EM has taken supplemental management actions and initiatives to improve safety awareness. These supplemental actions are also discussed for each ISM principle.

TABLE 1. EM-HQ SAFETY MANAGEMENT SYSTEMS TO EXECUTE ISM PRINCIPLES

ISMS Guiding Principles	Supplemental Safety Culture Principles	ISM Core Functions	Safety Culture	Management Systems to Execute Principles
1. Line Management Responsibility	1. Individual Attitude and Responsibility for Safety 2. Operational Excellence 3. Oversight for Performance Assurance 4. Organizational Learning for Performance Improvement	*All Core Functions apply to these 11 Principles 1. Define Scope of Work 2. Identify and Analyze Hazards 3. Develop and Implement Hazard Controls 4. Perform Work Within Controls 5. Feedback and Continuous Improvement	• Leaders demonstrate commitment to safety	• Project Management System • EM FRA • Assessment and Oversight Program • Safety and Health Management
2. Clear Roles and Responsibilities			• Everyone is responsible for safety • Trust permeates the organization	• EM FRA • HR Management Systems • Safety and Health Management
3. Competence Commensurate with Responsibilities			• Organizational learning is embraced • A questioning attitude is cultivated	• Safety and Health Management • HR Management Systems
4. Balanced Priorities			• Decision-making reflects safety first	• Financial Management • Safety and Health Management • Acquisition Services and Procedures • Engineering and Technology Program • Project Management System • HR Management System
5. Identification of Safety Standards / Requirements 6. Hazard Controls Tailored to Work			• Operations reflect appropriate controls	• Policy Development • Safety and Health Management • Acquisition Services and Procedures • Assessment and Oversight Program • Project Management System • Waste Management Systems
7. Operations Authorization			• Safety undergoes constant examination	• Engineering and Technology Program • Safety and Health Management

The following sections identify the EM safety culture attributes, management systems, supplemental safety actions, and POMCs for each ISM principle and core function. These sections describe how the EM systems and other management actions help achieve the qualities of a safety conscious workplace.

6.1.1 Principle 1: Line Management Responsibility for Safety

An effective safety management system must ensure that line management is directly responsible for the protection of the public, the workers, and the environment.

EM develops and implements effective management systems to ensure line management is directly responsible for the protection of the public, the workers, and the environment.

Performance Objectives, Measures and Commitments (POMC)

Objectives and Attributes

- All EM management will "lead by example" and understand and accept their safety responsibilities.
- All EM management will demonstrate a commitment to safety.
- EM has a safety conscious work place.
- Corrective actions are implemented in a timely manner.
- All EM management has a clear understanding of work activities and objectives.
- Managers practice visible leadership by coaching, mentoring, conducting weekly field managers calls, performing monthly safety reviews with field, Federal and Contractor management, and reinforcing standards.
- HQ managers are the source of programmatic direction on all projects. Support organizations perform program evaluations and provide the line independent observations.
- Managers perform effective oversight of field activities and self-assessments.
- Strategic plans, manuals, directives, procedures, and desk instructions are posted on the EM portal web page for easy access and reference.
- Weekly calls, monthly reports and quarterly reviews maintain awareness and oversight of field activities.

Functional Areas Incorporating EM Management Systems to Achieve Objectives and Attributes

- Project Management System
- EM FRA
- Assessment and Oversight Program
- Safety and Health Management

System Policies and Procedures

- DOE M 411.1-1C, Safety Management Functions, Responsibilities, and Authorities Manual.
- SOPP #44 (Replaces PS-5.15), EM Delegation of Safety Authorities.
- EM Oversight SOPP.
- DOE O 226.1A, Department of Energy Oversight Policy.
- DOE M 413.1-1, Project Management for the Acquisition of Capital Assets.

Performance Measures and Commitments

- Safety Performance Elements incorporated in senior management performance plans.
- Safety Performance Elements incorporated in safety professional performance plans.
- ISMSD updated annually.
- Safety performance is monitored during the Quarterly Performance Reviews (QPRs).

6.1.2 Principle 2: Clear Roles and Responsibilities

An effective safety management system must ensure that clear and unambiguous lines of authority and responsibility for safety are established and maintained at all organizational levels within the DOE and its contractors.

EM ensures clear and unambiguous lines of authority and responsibility for safety through assigning responsibilities in the EM FRA and through formal delegation of authority and implementing effective safety management systems. EM sets direction for expectations and mission and communicates this to the Field.

Performance Objectives, Measures and Commitments (POMC)

Objectives and Attributes

- The lines of authority and responsibility for safety are defined for each organization (EM Mission and Functions Document (EMMFD), EM FRA, and Federal DOE position descriptions).
- All federal and contractor staff (employees) understand his/her job responsibilities, objectives, authorities and areas of required training.
- Employees understand the importance of adhering to safety standards.
- Employees offer innovative ideas to help solve problems and improve operations.
- Responsibility and authority for safety are well defined, understood and integral to work scope performance.
- Single-point accountability is maintained for important-to-safety decisions, allowing for ongoing assessment and feedback.
- Organizational safety responsibilities are comprehensive.
- Employees are held accountable for meeting standards and expectations to fulfill safety responsibilities.

Functional Areas Incorporating EM Management Systems to Achieve Objectives and Attributes

- EM FRA
- HR Management Systems
- Safety and Health Management

System Policies and Procedures

- DOE M 411.1-1C, Safety Management Functions, Responsibilities, and Authorities Manual.
- SOPP #44 (Replaces PS-5.15), EM Delegation of Safety Authorities.
- Office of Environmental Management Human Capital Management Plan.
- DOE M 450.4-1, Integrated Safety Management System Manual.

Performance Measures and Commitments

- EM FRA is updated as required.
- IPPs, IDPs, and PDs are reviewed and revised annually.
- 90% or greater of planned employee training is completed on schedule.
- All EM personnel will be given training and/or the opportunity to read the EM ISMSD.

6.1.3 Principle 3: Competence Commensurate with Responsibilities

An effective safety management system must ensure that personnel possess the experience, knowledge, skill, and abilities necessary to discharge their responsibilities.

EM maintains experts in safety on the HQ staff, including Certified Industrial Hygienists (CIH), Certified Safety Professionals (CSP), Certified Health Physicists (CHP), and Professional Engineers (PE), who prepare policy, determine requirements, perform oversight inspections, and are able to augment field staffs for reviews, approvals, and oversight. EH HQ provides resources for staff development, both within HQ and in the field. EM has processes to ensure that staffs are qualified in their areas of responsibilities. EM evaluates field staffs and determines delegation authority based on competence. To ensure personnel possess the experience, knowledge, skill, and abilities necessary to discharge their responsibilities, EM has implemented effective human resource management systems which identify needed skills, evaluate the employees' skills, identify skill gaps, and arranges for training to eliminate the gaps. EM encourages professional certification and supports education and certification fees that include but are not limited to CIHs, CSPs, CHPs, and PEs.

Performance Objectives, Measures and Commitments (POMC)

Objectives and Attributes

- EM recognizes employees are its most valuable asset and has a robust training program. EM training ensures technical capabilities are current for the employees.
- Key resources are recruited, selected and retained within the organization.
- Continuous learning is a sustained value through definitive training and qualification programs.
- Assignments and delegations of safety are made to individuals with the necessary technical expertise and experience.
- Training upholds management standards and expectations.
- EM employees are informed of the underlying lessons learned (LL) from significant industry events through a centralized DOE corporate LL program.
- EM federal staff is systematic and rigorous in making CD1 and CD2 decisions and in performing reviews and approvals which support safe, reliable plant operation, environmental cleanup, and facility construction.
- EM federal staff safety experts are available to augment field federal staff.
- EM cultivates a questioning attitude in its employees.
- EM has knowledgeable employees able to make a broad spectrum of project, operational and technical decisions.
- EM employees investigate and analyze anomalies.
- Candid dialogue and debate are present during the evaluation of safety issues.
- Differing opinions are welcomed and respected; EM employees have the freedom to raise differing professional opinions.

Functional Areas Incorporating EM Management Systems to Achieve Objectives and Attributes

- Safety and Health Management
- HR Management Systems

System Policies and Procedures

- DOE M 411.1-1C, Safety Management Functions, Responsibilities, and Authorities Manual.
- U.S. DOE Federal Technical Capability Program Corrective Action Plan, August 30, 2005.
- SOPP # 44(Replaces PS-5.15), EM Delegation of Safety Authorities.
- Office of Environmental Management Human Capital Management Plan.
- DOE O 331.1B, Change 1, Employee Performance Management System.
- DOE O 360.1B, Federal Employee Training.

Performance Measures and Commitments

- Review (as necessary) qualifications and appropriateness of delegations.
- Technical Qualification Program requirements have been met for all safety SMEs.
- Senior Management will be Senior Technical Safety Manager (STSM) trained.

6.1.4 Principle 4: Balanced Priorities

An effective safety management system requires that resources be appropriately allocated to address safety, programmatic, and operational considerations. Protecting the public, workers, and the environment shall be a priority when work activities are planned and performed.

The EM Headquarters Office sets priorities for all of EM and leads the annual budget preparation to acquire and allocate the necessary funds to implement its mission and ensure safety. The top priority is the conduct of compliant and safe operations, with an emphasis on site closures. EM HQ both sets priorities and communicates them to field offices for implementation. EM HQ will annually review the EM five year plan and adjust to the budget management concerns and safety priorities affecting the program. The HQ Office performs compliance audits to assure that field actions are performed in accordance with EM priorities. EM requires appropriate allocation of resources to address safety, programmatic, and operational considerations. Project management systems in DOE O 413.3A are in place to guide, monitor, and evaluate work scope performance. Activities needed to protect the public, workers, and the environment is funded as top priority.

Performance Measures, Objectives, and Commitments (POMC)

Objectives and Attributes

- Project management systems are in place to plan the mission, evaluate performance, control cost to authorized funding levels, and implement baseline changes as needed.
- Safety and quality concerns receive full consideration in funding/schedule decisions.
- System checks and balances ensure safety considerations are adequately weighed and prioritized.
- Adjust the EM five year plan to reflect management concerns and safety priorities affecting the program.
- Monthly and quarterly project and program reviews occur with each Field Office to review technical, cost, schedule, and safety performance.
- Safety and quality requirements are incorporated into acquisitions.
- Safety and quality are incorporated into projects and activity reviews specific to technology development and implementation.
- EM management is informed of significant safety issues in a timely manner.
- Adjust EM budget priorities to address safety concerns.

Functional Areas Incorporating EM Management Systems to Achieve Objectives and Attributes

- Financial Management
- Safety and Health Management
- Acquisition Services and Procedures
- Engineering and Technology Program
- Project Management System
- HR Management System

System Policies and Procedures

- DOE M 413.3-1, Project Management for the Acquisition of Capital Assets.
- DOE O 413.3A, Change 1, Program and Project Management for the Acquisition of Capital Assets.
- SOPP #44 (Replaces PS-5.15), EM Delegation of Safety Authorities.
- 10 CFR 851, Worker Safety and Health.

Performance Measures and Commitments

- EM management will ensure that technical reviews of capital projects, D&D projects, and alternative technology projects consider safety requirements and conditions.
- EM management will ensure acquisitions incorporate relevant safety requirements.
- EM will annually review the EM five year plan and adjust to the budget management concerns and safety priorities affecting the program.
- EM safety highlights and normalization scores will be distributed to EM-1 and EM-3 and made available on the EM portal.

6.1.5 Principle 5: Identification of Safety Standards and Requirements

An effective safety management system requires that before work is performed, associated hazards are evaluated, and safety standards and requirements are established. Safety standards and requirements should provide adequate assurance that if they are properly implemented, the public, workers, and environment will be protected from adverse consequences.

DOE has directives, guides and manuals that are carefully applied in planning work. EM identifies applicable DOE directives and provides EM supplements, as needed. EM provides leadership in the Directives Process, originating, issuing and revising directives, orders, and polices that protect employee health and safety, as well as that of contractors, the general public, and the environment. The EM Office of Primary Interest (OPI) provides unique guidance on inactive wastes and for transportation issues related to hazardous materials and wastes. EM participates in the RevCom process to be sure that EM needs are addressed. EM's Source Selection Board reviews requests for proposals (RFP) prior to issuance to ensure adequate identification of hazards on List B and applicable safety standards and requirements and provides contract reviews. EM HQ reviews and either disallows or recommends approval for contractor-submitted variance requests under 10 CFR 851. The EM Acquisition Advisory Board (EMAAB) is charged to identify safety standards and requirements early in the acquisition process. EM ensures that safety requirements are established and approved for each project's safety basis.

Performance Measures, Objectives, and Commitments (POMC)

Objectives and Attributes

- Clear technical safety directives are established based on sound engineering data and judgment.
- Clearly-defined safety requirements incorporated into operations and construction contracts.
- Issue additional requirements to identify critical safety functions and require their management as priority items.
- Safety basis approvals are performed by EM-HQ or formally delegated to the EM Field Offices.
- EM will manage contracts to enforce safety performance.
- EM controls and enforces design and operating margins and approves wavers and deviations based upon thorough analysis of safety requirements.

Functional Areas Incorporating EM Management Systems to Achieve Objectives and Attributes

- Project Management System
- Policy Development
- Safety and Health Management
- Acquisition Services and Products

System Policies and Procedures

- Correct determination of List A/List B requirements, DEAR contract clause 970.5204 (Project Management System).
- Implementation of the Environmental Management System (EMS) per DOE O 450.1-2 is integrated into ISM.
- SOPP #44 (Replaces PS-5.15), EM Delegation of Safety Authorities.
- EMAAB Charter.
- 10 CFR 830, Nuclear Safety Management.
- DOE O 251.1B, Departmental Directives Program.

Performance Measure and Commitments

- EM performs safety basis reviews in accordance with commitments.

6.1.6 Principle 6: Hazard Controls Tailored to Work Being Performed

An effective safety management system requires that administrative and engineering controls designed to prevent and mitigate hazards be tailored to the work being performed and the associated hazards.

EM must balance risk and mission to accomplish environmental goals for DOE. EM oversees, requires, approves, and tracks work progress and recommends hazards controls, based on DOE standards, expert knowledge, trends analysis, and risk assessment. EM provides concurrence on proposed controls and oversight of all projects. EM typically delegates this function to the field. Where not delegated, EM participates in development, reviews and approves safety evaluation reports (SERs). EM reviews operating experience data to identify problems in the field. EM also performs oversight to evaluate implementation of hazard controls in the field and confirm that work is performed within the scope of the project. EM has responsibility to certify transportation controls for hazardous materials and packages. The EM Office of Safety Management develops, coordinates, and implements Technical Standards specific for the work performed by EM. EM requires contractor administrative and engineering controls to prevent and mitigate hazards tailored to the work being performed.

Performance Measures, Objectives, and Commitments (POMC)

Objectives and Attributes

- EM work will be performed within the controls specified within the authorization basis documentation.
- EM work hazard analyses will be based on sound engineering data and judgment.
- EM work is designed and controlled to reduce/eliminate the hazards.
- Work is not performed until the hazard analysis is complete and potential threats are addressed.
- EM will provide sufficient oversight to ensure controls within the authorization basis adequately address known hazards.

Functional Areas Incorporating EM Management Systems to Achieve Objectives and Attributes

- Safety and Health Management
- Assessment and Oversight Program
- Waste Management Systems

System Policies and Procedures

- 10 CFR 830, 835, 850 and 851, Department of Energy safety regulations.
- 29 CFR 1910, Occupational Safety and Health Standards for General Industry
- 29 CFR 1960, Department of Labor safety regulations.
- SOPP #44 (Replaces PS-5.15), EM Delegation of Safety Authorities.
- DOE O 440.1B, Worker Protection Management for DOE Federal Employees.
- DOE HQ O 442.1, Headquarters Occupational Safety and Health Program.
- DOE O 450.1, Change 1, Environmental Protection Program.

Performance Measures and Commitments

- EM will perform multiple assessments of field elements to ensure the adequacy of their oversight programs.
- EM will perform multiple assessments of EM contractors to ensure work is performed within appropriate controls.
- EM will ensure Authorization Basis documentation is adequately reviewed.

6.1.7 Principle 7: Operations Authorization

An effective safety management system requires that the conditions and requirements that must be satisfied for operations to begin and continue be clearly established and agreed on.

An ISMS is a process to confirm adequate preparation, including adequacy of controls, prior to authorizing all work, including nuclear and non-nuclear, to begin at the facility, project, or activity level. DEAR 970.5223-1(b)(7) requires that DOE and the contractor establish and agree upon the conditions and requirements to be satisfied for operations to be initiated and conducted. These conditions and requirements are included in the contract and are therefore binding upon the contractor. The formality and rigor of the review process and the extent of documentation and level of authority for agreement should be based on the hazard and complexity of the work being performed. The process should ensure programs addressing all applicable functional areas are adequately implemented to support safe performance of the work.

A significant part of the work performed in EM is non-nuclear. For nuclear activities EM delegates authority for selected field offices to perform SER approvals and retains authority to perform these reviews for the remainder of the field offices and sites under its cognizance. EM reviews the field office SER approvals for those sites where delegation has not been granted. EM personnel maintain awareness of all facility activities through weekly teleconferences, monthly reports, and periodic site visits and inspections. Safety is integrated into the design basis for acquisitions. The EM Safety Basis Management System requires the safety standards, facility conditions, and requirements to be fully satisfied for construction and/or operations to begin. Throughout the operation of a project or field office, EM coordinates with outside authorities, such as Price Anderson Enforcement and DNFSB to ensure regulatory compliance and improve safety. EM has oversight authority for ongoing facilities, construction and procurement and performs assessments and oversight of the field to verify their performance. EM tracks, plans, and participates in Operational Readiness Reviews/Readiness Assessments and provides oversight.

Performance Measures, Objectives, and Commitments (POMC)

Objectives and Attributes

- EM will reduce the technical risk and uncertainty in the EM clean up program and projects by providing technical solutions where none exist, improved solutions that enhance safety or operating efficiency, or new solutions that reduce programmatic risks.
- EM verifies and approves readiness for operations to begin.
- EM oversight strengthens facility safety and improves operational performance.
- EM uses a comprehensive set of reviews and assessments to oversee safe and efficient operation/construction of facilities, including self-assessments, lessons learned, employee concerns, QA reviews, operational assessments and independent oversight.
- EM monitors Unreviewed Safety Questions (USQ) from the field to address new and emerging concerns, through the use of DOE corporate systems.

Functional Areas Incorporating EM Management Systems to Achieve Objectives and Attributes

- Engineering and Technology Program
- Safety and Health Management

System Policies and Procedures

- DOE-STD-3009-94, Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses.
- 10 CFR 830, Nuclear Safety Management.
- 10 CFR 851, Worker Safety and Health.
- SOPP #44 (Replaces PS-5.15), EM Delegation of Safety Authorities.

Performance Measures and Commitments

- EM will ensure that technical solutions consider a safety basis that reduces risk ALARA to workers, the public and the environment.
- EM will participate in or monitor readiness review activities requiring HQ approval for startup or restart.
- EM-HQ will support field sites in meeting independent verification requirements for technology and in developing authorized release limits for real and personal property that requires HQ approval.

DOE provided four supplemental Safety Culture Elements, in addition to the original seven ISM principles, to help develop the appropriate environment for ISMS. The four Supplemental Safety Culture Elements are as follows:

6.1.8 Supplemental Safety Culture Principle 1: Individual Attitude and Responsibility for Safety

Every EM employee accepts responsibility for safe mission performance. Individuals demonstrate a questioning attitude by challenging assumptions, investigating anomalies, and considering potential adverse consequences of planned actions. All employees are mindful of work conditions that may impact safety, and assist each other in preventing unsafe acts or behaviors.

Each EM staff member understands his/her role in performing EM work in a safe manner. The goals and mission of EM are communicated regularly to all staff and each has opportunities to support this mission and to raise questions concerning implementation. Each staff member has a stop work authority if a situation arises that causes an employee to have a reasonable belief that an immediate threat to health or safety exists and several systems exist for employees to report concerns about work related hazards. EM tracks these reporting systems to ensure that resolution is timely. This attention communicates EM's commitment to safety and encourages employee involvement. EM participates in the DOE Federal Employee Occupational Safety and Health (FEOSH) Program (DOE HQ O 442.1) that provides workplace inspections, safety communications and training to Federal workers.

Performance Measures, Objectives, and Commitments (POMC)

Objectives and Attributes

- EM employees understand and demonstrate responsibility for safety. Safety and its ownership are apparent in everyone's actions and deeds.
- EM employees are actively involved in identification, planning, and improvement of work and work practices. They follow approved procedures. They can stop unsafe work at any level or during unexpected conditions.
- EM employees promptly report errors and incidents. They feel safe from reprisal in reporting errors and incidents; they offer suggestions for improvements.
- EM employees maintain a questioning attitude toward safety and are intolerant of conditions or behaviors that have the potential to reduce operating or design margins.

Functional Areas Incorporating EM Management Systems to Achieve Objectives and Attributes

- Safety and Health Management
- HR Management Systems
- EM FRA

System Policies and Procedures

- DOE M 411.1-1C, Safety Management Functions, Responsibilities, and Authorities Manual.
- RIMS, Human Resources Management System.

- DOE M 450.4-1, Integrated Safety Management System Manual.
- U.S. DOE Federal Technical Capability Program Corrective Action Plan, August 30, 2005.
- DOE O 331.1B, Change 1, Employee Performance Management System.
- DOE O 360.1B, Federal Employee Training.

Performance Measures and Commitments

- To be developed annually.

6.1.9 Supplemental Safety Culture Principle 2: Operational Excellence

EM achieves sustained, high levels of operational performance, encompassing all DOE and contractor activities to meet mission, safety, productivity, quality, environmental, and other objectives. High-reliability is achieved through a focus on operations, conservative decision-making, open communications, deference to expertise, and systematic approaches to eliminate or mitigate error-likely situations.

EM provides layers of systems and processes to foster a culture and performance of safety excellence. Performance is measured and tracked to maintain safe operations and progress. Close communications are a key. EM holds its personnel to high standards of performance and utilizes the expertise of its staff to ensure appropriate levels of review, analysis, and decision-making. EM provides incentives for operational excellence in the contract language it prepares and in the oversight of contractor performance. A major initiative in operational excellence is the accelerated site cleanup schedule and safe performance by contractors. This is rewarded with increased contract fees, as specified in language written and approved by EM. EM is leading efforts to safely construct and operate facilities, to treat, store and transport wastes in order to accomplish cleanup. As part of its configuration control, EM has developed quantitative corporate performance measures to monitor annual and life-cycle progress in meeting these cleanup goals and reducing risk. These measures establish performance expectations and accountability. EM also rewards its employees who achieve significant milestones in improving safety. EM supports participation in VPP as recognition of safety excellence.

Performance Measures, Objectives, and Commitments (POMC)

Objectives and Attributes

- EM management is in close contact with the front-line; they pay attention to real-time operational information. Maintaining operational awareness is a priority. Line managers identify critical performance elements and monitor them closely.
- EM employees provide prompt attention and evaluation to operational anomalies, even small ones – this allows early detection of problems so necessary action is taken before problems grow.
- EM employees are systematic and rigorous in making informed decisions that support safe, reliable operations. Line managers support and reinforce decisions based on available

information and risks.

- EM organizational systems and processes are designed to provide layers of defenses, recognizing that people are fallible.

Functional Areas Incorporating EM Management Systems to Achieve Objectives and Attributes

- Safety and Health Management
- HR Management Systems
- Assessment and Oversight Program
- EM FRA

System Policies and Procedures

- DOE M 411.1-1C, Safety Management Functions, Responsibilities, and Authorities Manual.
- DOE O 226.1A, Department of Energy Oversight Policy.
- SOPP #44 (Replaces PS-5.15), EM Delegation of Safety Authorities.
- EM Oversight SOPP.
- DOE M 413.3-1, Project Management for the Acquisition of Capital Assets.

Performance Measures and Commitments

- To be developed annually.

6.1.10 Supplemental Safety Culture Principle 3: Oversight for Performance Assurance

Competent, robust, periodic and independent oversight is an essential source of feedback that verifies expectations are being met and identifies opportunities for improvement. Performance assurance activities verify whether standards and requirements are being met. Performance assurance through conscious, directed, independent reviews at all levels brings fresh insights and observations to be considered for safety and performance improvement.

EM provides extensive performance assurance oversight through several mechanisms, including RAs, oversight inspections, assessments, SER reviews and QA reviews. EM fully supports and expects all employees and contractors to use the ORPS, CAIRS, and NTS reporting systems to provide timely reporting of occurrences and tracks these to ensure that appropriate action is taken. Periodic reports detail progress and any problems in project performance. Independent oversight is carried out by qualified EM staff to review documentation and conduct field visits and audits of operations. EM performance achievements and trends are reported to the Assistant Secretary who sets priorities for action and funding. The personal interest by the Assistant Secretary elevates the importance of safety performance at all levels. Problems are discovered early in the process so that interventions can be taken to prevent further damage and to apply lessons learned to other ongoing projects. The EM staff provides expertise to field activities to assist in technical issues and to measure progress.

Performance Measures, Objectives, and Commitments (POMC)

Objectives and Attributes

- EM assures its performance through robust, frequent, and independent oversight activities, conducted at all levels of the organization. Performance assurance includes independent evaluation of performance indicators and trend analysis. A mix of internal and external oversight reviews reflects an integrated and balanced approach.
- EM management throughout the organization set an example for safety through their direct involvement in oversight activities and associated performance improvement. Performance improvement receives adequate and timely attention.
- Periodic ISM reviews, assessments, and verifications are conducted and used as a basis for ISM program adjustments and implementation improvements.
- EM management is periodically briefed on results of oversight group activities to gain insight into organizational performance and to direct needed corrective actions.

Functional Areas Incorporating EM Management Systems to Achieve Objectives and Attributes

- Financial Management
- Engineering and Technology Program
- Project Management System
- HR Management System
- Policy Development
- Safety and Health Management
- Acquisition Services and Procedures
- Assessment and Oversight Program
- Waste Management Systems

System Policies and Procedures

- DOE M 413.3-1, Project Management for the Acquisition of Capital Assets.
- DOE O 413.3A, Change 1, Program and Project Management for the Acquisition of Capital Assets.
- 10 CFR 851, “Worker Safety and Health.”
- Correct determination of List A/List B requirements, DEAR contract clause 970.5204 (Project Management System).
- SOPP #44 (Replaces PS-5.15), EM Delegation of Safety Authorities.
- Implementation of the Environmental Management System (EMS) per DOE O 450.1-2 is integrated into ISM.

- EM Guidance on Inactive sites.
- EMAAB Charter.
- 10 CFR 830, Nuclear Safety Management.
- DOE O 251.1B, Departmental Directives Program.
- 29 CFR 1910, Occupational Safety and Health Standards for General Industry
- 29 CFR 1960, Department of Labor safety regulations.
- DOE O 440.1B, Worker Protection Management for DOE Federal Employees.
- DOE HQ O 442.1, Headquarters Occupational Safety and Health Program.
- DOE O 450.1, Environmental Protection Program.

Performance Measures and Commitments

- To be developed annually.

6.1.11 Supplemental Safety Culture Principle 4: Organizational Learning for Performance Improvement

The EM organization will demonstrate excellence in performance monitoring, problem analysis, solution planning, and solution implementation. The organization encourages openness and trust, and cultivates a continuous learning environment.

Performance monitoring is a cornerstone of performance improvement. Information reported to EM and independently gathered by EM is analyzed to discover both trends in performance excellence and emerging problems. Analyses and summaries are shared throughout EM via bulletins, emails, conference calls and newsletters. Lessons learned are written up and posted for others to learn. EM encourages open communication and provides numerous opportunities for employees to share information and concerns. EM supports the DOE Operations Experience Order 210.2. EM gathers information from the field on achievements and lessons learned and shares them throughout EM in quarterly reviews.

Performance Measures, Objectives, and Commitments (POMC)

Objectives and Attributes

- EM actively and systematically monitors performance through multiple means, including issue reporting, performance indicators, trend analysis, benchmarking, industry experience reviews, self-assessments, and performance assessments. Feedback from various sources is integrated to create a full understanding.
- EM management is actively involved in all phases of performance monitoring, problem analysis, solution planning, and solution implementation to resolve safety issues.
- EM establishes processes to identify and resolve latent organizational weaknesses that can

aggravate relatively minor events if not corrected.

- EM employees convene to swiftly uncover lessons and learn from mistakes.

Functional Areas Incorporating EM Management Systems to Achieve Objectives and Attributes

- Engineering and Technology Program
- Safety and Health Management
- Project Management System

System Policies and Procedures

- DOE M 413.3-1, Project Management for the Acquisition of Capital Assets.
- DOE O 413.3A, Change 1, Program and Project Management for the Acquisition of Capital Assets.
- DOE-STD-3009-94, Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses.
- SOPP #44 (Replaces PS-5.15), EM Delegation of Safety Authorities.
- 10 CFR 830, Nuclear Safety Management.
- 10 CFR 851, Worker Safety and Health Program.

Performance Measures and Commitments

- To be developed annually.

6.2 Implementation of the Five Core Functions

DOE P 450.4, *DOE Safety Management System Policy*, lists the five core safety management functions that provide the necessary structure for any work activity that could potentially affect the public, the workers, and the environment. The functions are applied as a continuous cycle with the degree of rigor appropriate to address the type of work activity and the hazards involved.

EM has integrated the five core functions with its 11 ISM principles. As such, the attributes, applicable management systems and POMCs have already been discussed. Table 1 shows the relationship between core functions and the ISM principles. The first three principles are commonly applicable to all five functions. The following sections summarize the EM management approach for each core function.

Work Planning and Control (WP/C) within EM is patterned after the ISM core functions at an activity level. All types of hazards including industrial are typically identified using an activity level hazard analysis and appropriate controls established and implemented via work packages. The WP/C process along with feedback/improvement typically discussed at post job briefings is very much in alignment with the ISM core functions. EM HQ is not involved in developing or

implementing this level of detail as this process is at the site contractor and/or facility representative levels. For a facility level safety basis (e.g. Documented Safety analysis per

10 CFR 830), EM HQ has approval authorities for certain sites. EM HQ also includes the effectiveness of WP/C processes as part of our ISM oversight assessment scope.

6.2.1 Core Function 1: Define Scope of Work

Missions are translated into work, expectations are set, tasks are identified and prioritized, and resources are allocated.

Strategic planning is the first step in defining work scope. ISMS is a process to confirm adequate preparation, including adequacy of controls, prior to authorizing all work, to begin at the facility, project, or activity level. These conditions and requirements are included in the contract and are therefore binding upon the contractor. A significant part of the work performed in EM is non-nuclear. DOE HQ maintains a five-year plan for Environmental Management, http://www.em.doe.gov/pdfs/EM_FYP_Final_3-6-06.pdf for establishing goals and direction for all work. In addition, EM develops an annual plan each year. The DOE strategic plan defines strategic goals and objectives for its business line. EM translates the strategic plan into definable work scope, both nuclear and non-nuclear, and provides strategic and out year planning guidance to field elements for integration into contractor work performance. For effective planning, strategic development and updates are aligned with the budget formulation and execution cycle.

The EM project measurements performance baseline serves as the execution document for each fiscal year's work. The baseline defines work scope, schedules (milestones), POMCs, and carry-over as well as new encumbrances and resources (estimated manpower and costs) for the fiscal year. The EM baseline, as the execution document, is also a collection point for all fiscal year POMCs and milestones from program-specific planning documents.

DOE M 413.3-1, *Project Management for the Acquisition of Capital Assets*, also defines the formal process for changing work scope. The EM-HQ change control process ensures that appropriate management officials approve baseline changes exceeding defined thresholds before beginning work. The change control process also ensures that the baseline is not changed unless associated with a change of scope.

Figure 5 shows graphically how the core functions integrate with the ISM principles for work scope definition.

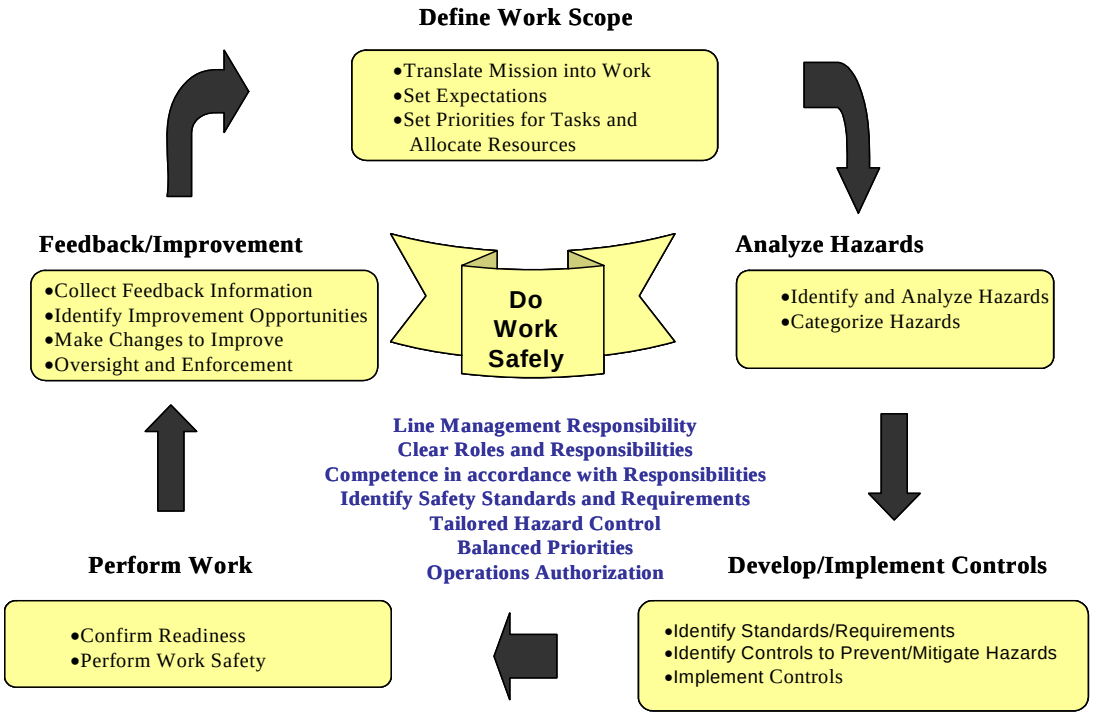

FIGURE 5. CORE FUNCTIONS AND APPLICABLE PRINCIPLES

The performance measurement baseline consists of technical, scope, and related cost estimates as established in the project baseline. The technical requirements and objectives are used to develop the technical baseline, including work scope. The cost baseline represents estimates, units and dollars required to accomplish the technical work scope. The schedule baseline provides a set of time-phased, logic-driven activities which incorporate the work scope as constrained to cost. This baseline is the starting point for any subsequent baseline change management and is modified only through a formal, documented change.

6.2.2 Core Function 2: Analyze the Hazards

Hazards associated with work are identified, analyzed, and categorized.

The objective of hazards analysis is to develop an understanding of the potential for the hazard to affect the health and safety of the worker, the public, and the environment. Hazard controls are then established based on this understanding and other factors related to the work. The analysis includes two steps: (1) identifying and categorizing the hazard and (2) analyzing accident scenarios related to hazardous work. In identifying hazards at the task/activity level, workers are a valuable resource for their knowledge of the process and its hazards. Categorization may address the character of the work [nuclear, chemical, thermal, electrical, and kinetic (motion)] and the magnitude of the hazard. For example, during work design, or in the early project planning stages, hazards may be identified and evaluated using broad, simple tools that delineate hazards and assess the potential magnitude of the harm. At this stage, a simple hazard analysis can be sufficient as a tool for design evaluation and design improvement.

Safety analysis is the documented process that includes systematic identification and assessment of hazards posed by a nuclear facility or operation for the protection of workers, the public and the

environment. EM-HQ personnel review site management to ensure the review of facility safety documentation, including hazards analyses, facility classifications, USQs, and structures, systems, and components classifications are complete. EM issues SERs documenting review of contractor safety revisions and the basis for approving authorization basis documents. EM site management continuously monitors and assesses contractor processes for identifying, analyzing, and categorizing facility and activity hazards. EM site management oversees the technical baseline (as defined in the contractor project baseline plans) for all facility process and safety systems and conducts surveillances on contractor engineering organizations in support of operations. This ensures that safety documentation accurately reflects the plant/system technical basis and that required safety evaluations are performed. EM site management oversee test plans and test procedures to ensure they accurately reflect plant configuration and ensure that test acceptance personnel evaluate the performance of contractor engineering organizations as part of operations support. Review and approval of the DSAs by EM site management requires development of an SER. When not delegated to the field, review and approval of SER is held with EM-HQ.

EM uses Standards/Requirements Identification Documents (S/RID) and Work Smart standards to establish the level of hazard analysis and documentation required for EM work activities. Responsibility for development and approval of an auditable hazard analysis rests with the site management and operating contractor, when delegated to the site. When not delegated, EM-HQ has this responsibility.

EM site management is responsible to ensure that the contractor establishes the requirement to use an ISM-based process to develop the design and construction authorization basis. The contractor is required to: (1) define its processes, (2) identify the hazards associated with the defined processes, (3) develop control mechanisms to mitigate the hazards, and (4) define standards to implement the control mechanisms. The contractor submits its analysis and proposed standards to the EM line organization for approval. EM-HQ, where applicable, provides review of contracts.

6.2.3 Core Function 3: Develop and Implement Hazard Controls

Applicable standards and requirements are identified and agreed on, controls to prevent or mitigate hazards are identified, the safety envelope is established, and controls are implemented.

Before work is performed, the associated hazards are evaluated and site management and the operating contractor agree upon a set of ES&H requirements that, if properly implemented, will provide adequate assurance that the public, the workers, and the environment are protected for all nuclear and non-nuclear work activities.

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 require DOE approval. Authorization agreements are required for all EM activities. Authorization agreements are developed in conjunction with startup (or restart) approval by DOE, approval of authorization basis documents by DOE, or any other direction provided to the contractor that alters the scope of operations, special terms, or conditions specified by DOE.

The authorization basis (or safety basis) consists of the facility design basis and operational requirements that DOE relies on to authorize operation, and is described in documents, such as the DSAs and PDSAs, other safety analyses, hazard classification documents, TSR, DOE-issued SERs, and other facility-specific commitments made to ensure compliance with DOE Orders, rules, or policies.

TSRs are important authorization basis documents which define the conditions, safe boundaries, and the management or administrative controls necessary to ensure the safe operation of a nuclear facility. TSR controls are also designed to reduce potential risk to workers and the public from uncontrolled releases of radioactive materials or from radiation exposures due to inadvertent criticality. TSRs include safety limits, operating limits, surveillance requirements, administrative controls, use and application instructions, and their bases, in support of the DSA. The TSR constitutes a contract between DOE and the facility operating management regarding the safe operation of the facility.

USQ evaluations are important in maintaining the integrity of safety basis documents. A USQ exists if one or more of the following conditions result: (1) the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety as previously evaluated in the DSA could be increased, (2) the possibility for an accident or malfunction of a different type than any previously evaluated in the DSA could be created, or (3) any margin of safety as defined in the bases of the TSR could be reduced. Inherent in an activity resulting in a USQ is the need for additional controls to be approved by EM, necessitating a change to the facility authorization basis. EM oversight of the TFC's USQ program ensures the authorization basis approved by DOE remains current and provides adequate level of protection to workers, the public, and the environment.

Verification of controls is the responsibility of the EM site managements' oversight programs. Through assessments, EM-HQ routinely conducts field verification of controls.

6.2.4 Core Function 4: Perform Work within Controls

Readiness is confirmed and work is performed safely.

EM-HQ mission is to provide leadership, direction, and oversight to ensure site programs, operations, and resources are managed in an open, safe, environmentally sound, and cost-effective manner.

DOE P 226.1A, *Department of Energy Oversight Policy*, requires that DOE HQ and field offices maintain operational awareness through planned assessments. EM HQ institutionalized integrated assessment process meets the requirements of DOE P 226.1A. The essential elements of the integrated assessment program are:

- Perform annual assessments of all key systems and programs;
- Strategically plan and schedule assessments to ensure the appropriate areas are being evaluated;
- Schedule the assessments formally and before the fiscal year begins;
- Status progress against the schedule;
- Measure progress on current assessments against prior assessments;
- Document and track all issues and findings;
- Coordinate corrective actions and track to satisfactory closure;
- Perform self-assessments on DOE systems, processes, and programs; determine the effectiveness of the DOE systems and incorporate corrective actions where required; and

- Independent oversight processes are performed by DOE organizations that do not have line management responsibility for the activity. EM is open to suggestions and critiques from external organizations which can help us improve our operations.

EM technical staff performs assessments of site management and contractors performance to ascertain facility and program status, determine whether implementation of requirements is effective, and evaluate the effectiveness of the contractor's self-assessment program. A technical assessment is defined as an evaluation of performance based on awareness of work activities, data analysis, and a comparison with the results of the contractor's self-assessment. EM HQ consolidated annual assessment plan categorizes assessments by functional area/system, program, organization, and assessment type. EM technical assessments are performance based, focusing heavily on results and effectiveness in addition to ascertaining compliance with requirements.

EM-HQ is also responsible for performing reviews and assessments in support of readiness assessments and operational readiness reviews. Readiness to proceed falls under DOE O 425.1C, Startup and Restart of Nuclear Facilities. Specifically, this directive is used in performing EM's role in operational readiness reviews and readiness assessments. The criteria provided in these directives are often evaluated in the context of DOE O 430.1B, Real Property Asset Management.

EM has a stop work authority at all of its facilities, in accordance with DOE P 450.7, Department of Energy Environment, Safety and Health Goals. This places responsibility and authority on every DOE employee to stop work immediately, without the fear of reprisal, when they are convinced a situation exists that places them, their coworker(s), or the environment in danger. "Stop Work" is defined as stopping the specific task or activity that poses danger to human health and/or the environment.

6.2.5 Core Function 5: Provide Feedback and Continuous Improvement

Feedback information on the adequacy of controls is gathered, opportunities for improving the definition and planning of work are identified and implemented, line and independent oversight is conducted, and, if necessary, regulatory and enforcement actions occur.

EM-HQ promotes the following ten primary mechanisms to project evaluation and stimulating continuous improvement:

1. A management culture which encourages an inquisitive attitude and insistence for improving business practices;
2. A proactive facility representative program;
3. A disciplined approach to planning, scheduling, and performing the appropriate assessments each year;
4. Monthly project management reviews;
5. Use of a formal issues management and corrective action tracking system to track progress;
6. An integrated lessons learned program;
7. Alternative and safe channels for employees to voice a concern or differing opinion on a project activity;
8. Ongoing quality assurance reviews;
9. Price-Anderson Amendments Act and worker safety and health self-identification of issues and violations; and

10. Semi-annual contract performance reviews.

In accordance with DOE P 226.1A, EM-HQ oversees and reviews the information from the Field Offices to verify that these mechanisms exist to obtain and communicate feedback on EM and contractor activities. EM-HQ can, and does, review site contractors. EM-HQ gathers and retains the information and provides flow-down back to the field via weekly calls, monthly reviews, quarterly reports, Quarterly Performance Reviews (QPR), field status reports, reporting to the EM COO, and day to day contact with site liaison personnel. EM facility representatives observe facility operations and provide real-time informal and formally documented feedback related to facility operations and program implementation. Facility technical specialists and site technical specialists conduct technical assessments of activities under their cognizance; assessments serve as a formally documented source of feedback to the contractor. Technical assessments include evaluation of any applicable contractor self-assessments. Results of this evaluation are documented in the assessment and provided to the EM program manager overseeing the contractor self-assessment program. EM-HQ site visits, assessments, and inspections provide an independent perspective on facility operations and program implementation. Special EM assessments, including readiness assessments, operational readiness reviews, and authorization basis document reviews also evaluate contractor performance and are sources of feedback information.

EM-HQ monitors other site activities, ranging from surveillances and document reviews to task team participation as feedback sources. Key performance feedback is provided by EM site management as part of the formal contractor award fee and performance evaluation process. The amount of award fee the contractor earns at the end of a rating period is determined after due consideration of performance and feedback for the period. Contractors are encouraged to self identify and report problems and may reduce fines and penalties in certain areas if they do so (for example, Price-Anderson Amendments Act activities).

Effective and timely feedback is critical to identification of improvement opportunities. In addition to the EM feedback mechanisms discussed above, EM-HQ utilizes the Lessons Learned/Operating Experience program to sort and screen lessons learned pertaining to the operation of EM facilities, as well as other sites in the DOE complex. EM site management is encouraged to continually look for ways to improve contractor and DOE activities as part of the daily conduct of business. EM site personnel observe and participate in contractor critiques. Technical assessments and other evaluations of the contractor usually reveal opportunities for improvements, and committees that cut across organizational lines help disseminate information.

Continual improvement requires action in areas where feedback has been provided and opportunities for improvement have been identified. Specific direction to the contractor is given in accordance with contract provisions. Management direction and/or a change in procedure are used to effect change within EM. Changes made in response to an outside review are usually logged and tracked to closure, with a specific organization assigned the responsibility.

In addition to the elements discussed under Core Function 4, DOE P 226.1, *Department of Energy Oversight Policy,* also defines DOE oversight responsibility to include reviewing performance against formally established Environment, Safety, and Health (ES&H) POMCs. In accomplishing EM's oversight function, cognizant EM staff review performance against formally established ES&H POMCs and criteria set forth in procedures and guidance for specific programs and activities, such as emergency drill/exercise evaluations, oversight of training and qualification program activities, fire protection, radiation protection, environmental protection, and natural phenomena hazards mitigation. EM also uses information on reportable events, which is

documented and tracked in the Occurrence Reporting and Processing System (ORPS, NTS, CATS, and CAIRS) to identify trends and to assess corrective action effectiveness.

EM-HQ believes investigating, understanding, and responding to employee concerns provides a valuable tool to improve safety, the work environment and productivity. EM site management is expected to maintain an Employee Concerns Program (ECP) whereby employees and contractors who encounter concerns or allegations regarding safety issues, management, the environment, fraud, waste, abuse, work processes, acts of reprisal, intimidation or harassment in the work place have a safe and confidential channel to communicate their concerns.

7.0 INTEGRATION OF EMS AND QA INTO ISM

DOE O 450.1, *Environmental Protection Program*, establishes EMS requirements for Federal and contractor components. Federal EMS requirements are implemented through integration into the Federal ISM System Description, DOE M 450.4-1. The correlation of the EMS and QA components to the ISM principles and core functions is shown in Table 2.

Table 2. Correlation of EMS and QA to ISM

<table>
<tr><th>ISMS Guiding Principles</th><th>Supplemental Safety Culture Principles</th><th>ISM Core Functions</th><th>Quality Assurance Criteria</th><th>EMS Objectives</th></tr>
<tr><td rowspan="2">1. Line Management Responsibility
2. Clear Roles and Responsibilities
3. Competence commensurate with Responsibilities</td><td rowspan="2">1. Individual Attitude and Responsibility for safety
2. Operational Excellence</td><td rowspan="2">All Five Core Functions</td><td>• Quality Assurance Program</td><td rowspan="2">• Policy, Planning, Implementation and Operation</td></tr>
<tr><td>• Personnel Training and Qualification</td></tr>
<tr><td rowspan="2">4. Balanced Priorities</td><td rowspan="4">3. Oversight for Performance Assurance</td><td>1. Define Scope of Work
2. Identify and Analyze Hazards</td><td rowspan="3">• Work Processes
• Documents and Records
• Design
• Procurement</td><td>• Permitting</td></tr>
<tr><td></td><td>• Public health and environmental protection</td></tr>
<tr><td>5. Identification of Safety Standards/ Requirements
6. Hazard Controls Tailored to Work</td><td>3. Develop and Implement Hazard Controls</td><td>• Pollution Prevention
• Compliance</td></tr>
<tr><td rowspan="2">7. Operations Authorization</td><td>4. Perform Work Within Controls</td><td rowspan="2"></td></tr>
<tr><td>4. Organizational Learning for Performance Improvement</td><td>5. Feedback and Continuous Improvement</td><td>• Quality Improvement
• Inspection and Acceptance
• Management Assessment
• Independent Assessment</td></tr>
</table>

7.1 Environmental Management System

EM protects and is a good steward of the environment. To implement sound stewardship practices which protect the air, water, and land, EM-HQ enforces the responsibilities and requirements of DOE O 450.1 for itself and its contractors. The EMS is implemented to ensure environmental protection actions and measures are integrated into all work planning and performance. This is accomplished effectively by integrating EMS requirements into ISMS.

EMS is part of EM's overall ISMS approach for achieving workplace safety and environmental protection. EMS provides a systematic management process for identifying and addressing environmental consequences of an EM action. Processes within the EMS encompass a continuous

cycle of planning, implementing, and evaluating to ensure the safety of the workers and public and protection of the environment.

Programmatic components of EMS include:

- Permit Management,
- Pollution Prevention,
- Environmental Compliance,
- Environmental Oversight,
- National Environmental Policy Act (NEPA) Analysis,
- Radiation Protection and Radioactive Waste Management,
- Watershed Management, and
- Cultural Resource Management.

Through the implementation of EMS, EM ensures environmental management considerations are fundamental and integral components of the organization, ISMS, and contractor management. The integration of EMS into ISMS also ensures that the requirements from DOE O 450.1, *Environmental Protection Program*, are met. EM-HQ expects site management to review and evaluates prime contractor implementation of EMS into their ISMS programs.

7.2 Quality Assurance

EM is committed to quality of all mission results and the elimination of errors. Each site organization will have a Quality Assurance Program (QAP). The QAP describes the method by which quality assurance is implemented into ISMS and the overall work processes.

EM-HQ is committed to achieving quality in accordance with the "Quality Assurance Rule" (10 CFR 830, Subpart A) and DOE O 414.1C, *Quality Assurance*, by having a comprehensive QAP in place. EM is also committed to achieving quality in accordance with the requirements of the February 14, 2007, Memorandum of Agreement for Acceptance of Spent Nuclear Fuel and High-Level Waste between EM and RW. The QAP identifies those requirements and actions which are implemented to achieve this result.

The EM-HQ QAP places accountability for quality on each employee. In addition, it emphasizes the creation of an environment for resolving quality problems rapidly and an attitude of constant improvement. DOE has 10 criteria for quality assurance:

1) Establish an organizational structure, functional responsibilities, levels of authority, and interfaces for management, performance, and assessment of work. Establish management systems for planning work and resource allocation;

2) Train and qualify personnel to be capable of performing assigned work;

3) Establish and implement processes to detect and prevent quality problems. Identify the causes of problems and include prevention of recurrence as a part of corrective action planning;

4) Prepare, review, approve, issue, use, and revise documents to prescribe processes, specify requirements, or establish design. Specify, prepare, review, approve, and maintain records;

5) Perform work consistent with technical standards, administrative controls, and hazard controls adopted to meet regulatory or contract requirements using approved instructions and procedures;

6) Design items and processes using sound engineering/scientific principles and appropriate standards. Verify/validate work before approval and implementation of the design;

7) Procure items and services which meet established requirements and perform as specified. Evaluate and select prospective suppliers on the basis of specified criteria;

8) Inspect and test specified items, services, and processes using established acceptance and performance criteria;

9) Managers assess their management processes to identify and correct problems which hinder the organization from achieving its objectives; and

10) Plan and conduct independent assessments to measure item and service quality and the adequacy of work performance and to promote improvement.

8.0 STATUS OF INTEGRATION

EM currently relies on its organization structure and the assignment of roles and responsibilities to implement its ISMSD. The system is expert based and gaps identified in section 8.2 will be addressed during the planned implementation period.

In early CY 2007 EM conducted a self-assessment of safety functions and responsibilities associated with nuclear facilities. The team found that the assignments of nuclear safety responsibilities were identified and specifically assigned. The organizations and individuals who were assigned tasks associated with those responsibilities have the requisite qualifications and expertise to carry out those assignments. The team noted formal implementing processes for carrying out the responsibilities but identified areas where improvements could be made. EM will continue to perform self assessments similar to this relative to the implementation of the ISMSD.

8.1 Review of EM-HQ ISMSDs

The following action plan (Table 3) is established to maintain a continuous ISMS assessment and improvement process for the EM HQ ISMSD. The EM-HQ ISMSD is updated annually per DOE M 450.4-1. As EM-HQ performs its annual update of the ISMSD there will be a continuous improvement effort to make the POMCs more measurable.

TABLE 3. EM-HQ ISMS ACTION PLAN

Process Step	Action Description	Schedule	Action Responsibility
1.	Perform self assessment of federal safety management systems and components using DOE P 226.1A.	Ongoing throughout each fiscal year	EM-60
2.	Provide updates to safety management systems as necessary.	Ongoing throughout each fiscal year	Lead: EM-60 Support: EM-10, 20, 30, 40, and 50
3.	Provide updates to POMCs as necessary.	Ongoing throughout each fiscal year	Lead: EM-60 Support: EM-10, 20, 30, 40, and 50
4.	Revise ISMSD as necessary.	By May 31	EM-60
5.	EM-HQ completes its annual ISMS review/declaration.	By November 30	EM-60

8.2 Review of Field ISMSDs

The following action plan (Table 4) is established to maintain a continuous ISMS assessment and improvement process of field ISMSDs. The ISMSDs are updated annually.

TABLE 4. EM FIELD ISMS ACTION PLAN

Process Step	Action Description	Schedule	Action Responsibility
1.	EM-HQ performs assessments of field ISMS implementation using DOE P 226.1A.	Ongoing	EM-60
2.	EM-HQ requests field to: 1) review and revise ISMS Description as appropriate, and 2) conduct annual review and declaration of ISMS effectiveness.	By July 31	EM-60, EM-3
3.	Field submits ISMS Description revision and annual declaration of ISMS implementation to EM.	By October 30	EM Field Organizations
4.	EM-HQ completes review of field's annual ISMS declaration.	By November 30	EM-60

8.3 EM ISMSD Comparison to DOE M 450.4-1 Requirements

EM-HQ will continue to develop its ISMSD. The following analysis describes the gaps between the current EM-HQ ISMSD and the requirements in DOE M 450.4-1. Based on DOE M 450.4-1, Chapter II, Section 1.a. (1), the system description must describe the following:

ISMS DESCRIPTION REQUIREMENTS	DOES THE EM ISMSD MEET M 450.4-1 REQUIREMENTS?
HOW EM DEFINES ITS WORK ACTIVITIES RELATED TO ACHIEVING THE ISM OBJECTIVE OF SAFE MISSION ACCOMPLISHMENT, AS DEFINED IN DOE P 450.5, *SAFETY MANAGEMENT SYSTEM POLICY*	ALL ACTIVITIES IN SECTION 5.0 "ROLES AND RESPONSIBILITIES" HAVE NOT BEEN DEFINED BECAUSE IT IS UNLIKELY ALL MANAGEMENT SYSTEMS (AND THUS WORK ACTIVITIES) HAVE BEEN CAPTURED.
THE ISM IMPLEMENTING MECHANISMS, PROCESS AND METHODS HAVE BEEN IDENTIFIED FOR IMPLEMENTATION OF THE ISM GUIDING PRINCIPLES TO CREATE AN EFFECTIVE ENVIRONMENT FOR ISM IMPLEMENTATION AS DEFINED IN DOE M 450.4-1, CHAPTER 2.	ALL THE PRIMARY MECHANISMS, PROCESS AND METHODS HAVE NOT BEEN IDENTIFIED FOR THE ISM GUIDING PRINCIPLES. EM IS CURRENTLY AN EXPERT BASED ORGANIZATION. THE PRIMARY MECHANISM EM IS CURRENTLY RELYING ON IS A NEW ORGANIZATION STRUCTURE AND CLEAR ASSIGNMENT OF RESPONSIBILITIES. EM-60 WILL INCORPORATE THIS INFORMATION INTO FUTURE REVISION OF THE ISMSD AND ENSURE ITS IMPLEMENTATION.
THE ISM IMPLEMENTING MECHANISMS, PROCESS AND METHODS BEEN IDENTIFIED FOR IMPLEMENTATION OF THE ISM CORE FUNCTIONS	ALL THE PRIMARY MECHANISMS, PROCESS AND METHODS HAVE NOT BEEN IDENTIFIED FOR THE ISM CORE FUNCTIONS. EM IS CURRENTLY AN EXPERT BASED ORGANIZATION. THE PRIMARY MECHANISM EM IS CURRENTLY RELYING ON IS A NEW ORGANIZATION STRUCTURE AND CLEAR ASSIGNMENT OF RESPONSIBILITIES. EM-60 WILL INCORPORATE THIS INFORMATION INTO FUTURE REVISION OF THE ISMSD AND ENSURE ITS IMPLEMENTATION.
HOW THE EM EMS, QAP AND OTHER MANAGEMENT PROCESSES AND SYSTEMS BEEN INTEGRATED INTO THE ISM SYSTEM.	THESE SYSTEMS ARE IDENTIFIED IN THE ISMSD. FURTHER REFINEMENT OF THE INTEGRATION WILL BE PROVIDED IN FUTURE REVISIONS OF THE ISMSD.
HOW EM WILL MEASURE ISM EFFECTIVENESS, PERFORM	THE EM ISMSD PROVIDES A MINIMAL

ANNUAL ISM EFFECTIVENESS REVIEWS, PREPARE ANNUAL ISM DECLARATIONS, AND CONTINUOUSLY IMPROVE THE EFFECTIVENESS OF THE ISM SYSTEM.	SET OF HIGH LEVEL INDICATORS (SECTION 4.0). DETAILED MEASURABLE INDICATORS WILL BE IDENTIFIED DURING THE IMPLEMENTATION PERIOD OF THIS ISMSD. EM-60 WILL LEAD THIS EFFORT. THIS ISMSD DOES IDENTIFY THE PROCESS FOR PERFORMING ANNUAL DECLARATIONS.
HOW EM WILL ESTABLISH, DOCUMENT, AND IMPLEMENT RELEVANT SAFETY PERFORMANCE OBJECTIVES, MEASURES, AND COMMITMENTS IN RESPONSE TO SECRETARIAL DIRECTION AND BUDGET EXECUTION GUIDANCE WHILE MAINTAINING THE INTEGRITY OF THE ISM SYSTEM	ASSIGNMENTS OF POMCS HAVE BEEN MADE IN THIS ISMSD. FURTHER DEVELOPMENT OF THE POMCS, THEIR DOCUMENTATION AND THEIR RESPONSIBLE ORGANIZATION WILL BE MADE DURING THE IMPLEMENTATION PERIOD FOR THIS ISMSD. EM-60 WILL PROVIDE DIRECT SUPPORT OF THIS EFFORT.
HOW EM WILL MAINTAIN THE ISM DESCRIPTION SO THAT IT IS ACCURATE AND UP-TO-DATE, AND DEMONSTRATE CONTINUOUS IMPROVEMENT IN ITS PERFORMANCE OF SAFE WORK ACTIVITIES	TABLE 3 PROVIDES A DIRECT RESPONSE TO THIS REQUIREMENT. EM-60 WILL FURTHER DEVELOP THIS PROCESS BASED ON LESSONS LEARNED.
HOW THE ISM IMPLEMENTING MECHANISMS AND PROCESSES THAT WILL BE USED TO MEET EM'S RESPONSIBILITIES DELINEATED IN DOE M 450.4-1.	IT IS UNLIKELY ALL MANAGEMENT SYSTEMS (AND THUS MECHANISMS AND PROCESSES) HAVE BEEN CAPTURED.

APPENDIX A. EM MANAGEMENT SYSTEM, PERFORMANCE MEASURE AND COMMITMENT, AND RESPONSIBLE ORGANIZATION CROSSWALK

Functional Areas	Performance Objectives, Measure and Commitments	Responsibility
Engineering and Technology Program	• EM management will identify technology options, technical approaches, and design waste management and environmental remediation systems with safety as an inherent part of the project development and execution process • Ensure that DOE radiological protection requirements are met • Identify technical lessons learned and best practices to improve worker health and safety during D&D	EM-20
HR Management System	• Safety performance elements incorporated into senior management performance plans • IPPS, IDPs, and PDs are reviewed and revised annually • 90% or greater of planned employee training is completed on schedule	EM-40
Project Management System	• Safety performance is monitored during the QPR	EM-50
Assessment and Oversight Program	• EM performs safety basis reviews in accordance with commitments • EM will perform multiple assessments of field elements to ensure the adequacy of their oversight programs • EM will perform multiple assessments of EM contractors to ensure work is performed within appropriate controls • EM will participate in or monitor readiness review activities requiring HQ approval for startup or restart	EM-60

Functional Areas	Performance Objectives, Measure and Commitments	Responsibility
Safety and Health Management	• EM FRA is updated as required • ISMD updated annually • Safety performance is monitored during the QPR • All EM personnel will be given the opportunity to read the EM FRA • Review (as necessary) qualifications and appropriateness of delegations • Technical qualifications program requirements have been met for all SMEs • Senior management will be STSM trained • EM safety highlights and normalization scores will be distributed to EM-1 and EM-3 and made available on the EM portal • EM will ensure authorization basis documentation is adequately reviewed	EM-60
Safeguards and Security	Will be determined by EM-3.1	EM-3.1
Continuity of Operations	Will be determined by EM-3.1	EM-3.1
Environmental Compliance	• Identify relevant requirements, evaluate compliance with relevant requirements, and assist with development of documentation as needed	EM-10
Financial Management	• EM will annually review the EM five year plan and adjust to the budget management concerns and safety priorities affecting the program	EM-30
Acquisition Services and Products	• EM management will ensure acquisitions incorporate relevant safety requirements	EM-50
New EM Policy Development	• EM-1, 2 and 3 determines the need for new policy • EM-6 coordinates the development of new policy	EM-1, 2, 3, and 6

APPENDIX B. REFERENCES

The ability to link to certain documents is dependent upon the user's level of access. Contact your systems administrator should you have any problems accessing any of the following document hyperlinks.

DOE P 226.1A, *DOE Oversight Policy*.

DOE O251.1B, *Departmental Directives Program*.

DOE O 320.1 Change 1, *Acquiring and Positioning Human Resources*.

DOE O 360.1B, *Federal Employee Training*.

DOE M 411.1-1C, *Safety Management and Functions, Responsibilities, and Authorities Manual*.

DOE M 413.3-1, *Project Management for the Acquisition of Capital Assets.*

DOE O 413.3A, *Program and Project Management of the Acquisition of Capital Assets.*

DOE O 414.1C, *Quality Assurance*.

DOE O 420.1B, *Facility Safety*.

DOE O 425.1C, *Startup and Restart of Nuclear Facilities.*

DOE M 426.1-1A, *Federal Technical Capability Manual.*

DOE O 430.1B, *Real Property Asset Management*.

DOE O 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees*.

DOE O 440.2B Chg 1, *Aviation Management and Safety.*

DOE O 450.1, Change 1, *Environmental Protection Program*.

DOE G 450.4-1B, *Integrated Safety Management System Guide for use with Safety Management System Policies.*

DOE M 450.4-1, *Integrated Safety Management System Manual*.

DOE P 450.4, *Safety Management System Policy*.

DOE P 450.5, *Line Environment, Safety, and Health Oversight*.

DOE P 450.7, *DOE Environment, Safety, and Health Goals*.

DOE G 460.2-1, *Implementation Guide Departmental Materials Transportation and Packaging Management.*

DOE M 460.2, *Radioactive Material Transportation Practices Manual.*

DOE O 460.2 A, *Departmental Materials Transportation and Packaging Management.*

DOE HQ O 442.1, *Headquarters Occupational Safety and Health Program*.

Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 95-2 to the Secretary of Energy, dated October 11, 1995.

DOE-STD-3009-94, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses.*

DEAR 970.5204-2 (7), *DOE Management and Operating Contracts*.

DEAR 970.5215-3, *Conditional Payment of Fee, Profit, or Incentives.*

DEAR 970.5223-1, *Integration of Eenvironment, Safety, and Health into Work Planning and Execution.*

DEAR 970.5204-2, *Laws, regulations, and DOE directives.*

Code of Federal Register 10 CFR 830, *Nuclear Safety Management*.

Code of Federal Register 10 CFR 835, *Occupational Radiation Program.*

Code of Federal Register 10 CFR 850, *Chronic Beryllium Disease Prevention Program.*

Code of Federal Register 10 CFR 851, *Workers Safety and Health.*