Department of Energy
Washington, DC 20585

November 7, 2006

The Honorable A. J. Eggenberger
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, NW, Suite 700
Washington, D.C. 20004

Dear Mr. Chairman:

As the responsible manager for the Department's 2004-1 implementation plan, I am notifying you that the Department has issued the attached Department Manual on Integrated Safety Management, completing commitment 22B in our 2004-1 plan. The new Manual (DOE Manual 450-4.1, *Integrated Safety Management System Manual*) identifies and institutionalizes DOE requirements and responsibilities regarding development and implementation of ISM systems within DOE. It also provides requirements and guidance for DOE and contractors to ensure development and implementation of an effective ISM system that is periodically reviewed and continuously improved.

If you have any questions, please do not hesitate to contact me or Pat Worthington, the Director of the Office of Health and Safety (HS-10), at 301/903-5392. HS-10 is the Department's Office of Primary Interest for this Manual.

Sincerely,

Mark B. Whitaker, Jr.
Department Representative to the
Defense Nuclear Facilities Safety Board
Office of Health, Safety and Security

Enclosure

cc: Pat Worthington

MANUAL

DOE M 450.4-1

Approved: 11-1-06

INTEGRATED SAFETY MANAGEMENT SYSTEM MANUAL

U. S. DEPARTMENT OF ENERGY

Washington, DC

AVAILABLE ONLINE AT:
www.directives.doe.gov

INITIATED BY:
Office of Health, Safety and Security

INTEGRATED SAFETY MANAGEMENT SYSTEM MANUAL

1. PURPOSE. The purpose of this Manual is to clearly identify and institutionalize DOE requirements and responsibilities regarding development and implementation of Integrated Safety Management (ISM) systems within DOE. This Manual provides requirements and guidance for DOE and contractors to ensure development and implementation of an effective ISM system that is periodically reviewed and continuously improved.

2. CANCELLATION. None

3. APPLICABILITY.

   a. DOE Elements. Except as noted in paragraph 3c, this Manual applies to all Departmental elements that are responsible for the management and operation of the Department's facilities, including elements of the National Nuclear Security Administration and power administrations. (Go to http://www.directives.doe.gov/references/ for the current listing of Departmental elements. This list automatically includes all Departmental elements created after the Order is issued.)

   The Administrator of the National Nuclear Security Administration (NNSA) shall assure that NNSA employees and contractors comply with their respective responsibilities under this Manual. Nothing in this Manual will be construed to interfere with the NNSA Administrator's authority under section 3212(d) of Public Law (P.L.) 106-65 to establish Administration specific policies, unless disapproved by the Secretary.

   b. DOE Contractors. The Contractor Requirements Document (CRD), Attachment 1, sets forth requirements of this Manual that will apply to contractors performing design, construction, operation, and decommissioning of Department-owned facilities whose contracts include the CRD. This CRD must be included, as appropriate, in all contracts that include DEAR 970.5223-1, *Integration of environment, safety, and health into work planning and execution*.

   c. Exclusion. Activities conducted under the authority of the Director, Naval Nuclear Propulsion Program, as described in Executive Order 12344 and set forth in Public Laws 98-525 and 106-65.

4. CONTACT. Direct requests for additional information to the Office of Health, Safety and Security, Office of Health and Safety, at (301) 903-5392.

BY ORDER OF THE SECRETARY OF ENERGY:

CLAY SELL
Deputy Secretary

CONTENTS

CONTENTS (continued)

CONTENTS (continued)

CHAPTER I. OVERVIEW AND RESPONSIBILITIES

1. INTRODUCTION. The objective of ISM is to perform work in a safe and environmentally sound manner. More completely, as described in DOE P 450.4, *Safety Management System Policy*: "The Department and Contractors must systematically integrate safety into management and work practices at all levels so that missions are accomplished while protecting the public, the worker, and the environment. This is to be accomplished through effective integration of safety management into all facets of work planning and execution. In other words, the overall management of safety functions and activities becomes an integral part of mission accomplishment." The desired result is that work is accomplished in a safe manner. ISM is applicable to all facility life-cycle phases including design, construction, operation, and decontamination and decommissioning. In ISM, the term "safety" is used synonymously with environment, safety, and health (ES&H) to encompass protection of the public, the workers, and the environment.

   Throughout this Manual, ISM is defined to include applicable integration with Environmental Management System (EMS) and Quality Assurance Program (QAP). Requirements for this integration exist in related directives such as the integration of EMS per DOE O 450.1, *Environmental Protection Program,* and the integration of QAP per DOE O 414.1C, *Quality Assurance.*

   The Department developed and began implementation of ISM in 1996. Since that time, the Department has gained significant experience with its implementation. This experience has shown that the basic framework and substance of the Department's ISM program remains valid. The experience also shows that substantial variances exist across the complex regarding familiarity with ISM, commitment to implementation, and implementation effectiveness. The experience also shows that more clarity on DOE's role in effective ISM implementation is needed. Contractors and DOE alike have reported that clearer expectations and additional guidance on annual ISM maintenance and continuous improvement processes are needed.

   Since 1996, external organizations that are also performing high-hazard work, such as commercial nuclear organizations, Navy nuclear organizations, National Aeronautics and Space Administration, and others, have also gained significant experience and insight relevant to safety management. The ISM core function of "feedback and improvement" calls for DOE to learn from available feedback and make changes to improve. This concept applies to the ISM program itself. Lessons learned from both internal and external operating experience are reflected in this Manual to update the ISM program. Two significant sources of external lessons learned have contributed to this Manual: (1) the research and conclusions related to high-reliability organizations (HROs), and (2) the research and conclusions related to the human performance improvement (HPI) initiatives in the commercial nuclear industry, the U.S. Navy, and other organizations. HRO and HPI tenets are very complementary with ISM and serve to extend and clarify the program's principles and methods.

As part of the ISM revitalization effort, the Department wants to address known opportunities for improvement based on DOE experience, and integrate the lessons learned from HRO organizations and HPI implementation into the Department's existing ISM infrastructure. This Manual should be viewed as a natural evolution of the ISM program, using feedback for improvement of the ISM program itself. The Department wants to integrate the ISM core functions, ISM principles, HRO principles, HPI principles and methods, lessons learned, and internal and external best safety practices into a proactive safety culture where: facility operations are recognized for their excellence and high-reliability, everyone accepts responsibility for their own safety and the safety of others, organization systems and processes provide mechanisms to identify systematic weaknesses and assure adequate controls, and continuous learning and improvement is expected and consistently achieved. The revitalized ISM system is expected to define and drive desired safety behaviors, to help DOE and its contractors create a world-class safety culture, and ultimately to result in achievement of performance excellence.

This Manual is being issued to get the Department started in re-vitalizing ISM implementation. The Department recognizes that the existing ISM directives and DEAR clause contain some differences in comparison to this Manual. Every attempt was made to keep these inconsistencies to a minimum. As the Department gains experience in implementing the new DOE requirements contained in this Manual, it is expected that this Manual will need to be revisited and revised within two years to incorporate experience, best practices, and lessons learned. In the same timeframe, it is also expected that the full suite of ISM directives (described below) will be reviewed in parallel and adjusted as needed to bring them into full alignment. The ultimate location of the guidance contained in this Manual will be reviewed as part of this process. The Department's primary ISM directives are the following:

(1) DOE P 450.4, *Safety Management System Policy* – The ISM policy establishes the ISM program, its objective, its guiding principles and core functions, and its implementing mechanisms. This Policy defines the ISM program that the requirements and responsibilities in this Manual are targeted for implementing.

(2) DOE G 450.4-1B, Integrated Safety Management System Guide for Use with Safety Management System Policies (DOE P 450.4, DOE P 450.5, and DOE P 450.6); the Functions, Responsibilities, and Authorities Manual; and the DOE Acquisition Regulation– The ISM Guide provides guidance for contractors who are developing, implementing, and maintaining ISM systems. It also provides guidance for DOE to facilitate development, implementation and maintenance of contractor ISM systems. Much of the guidance in the ISM Guide may be useful to DOE offices that are developing ISM systems in response to the requirements in this Manual.

(3) DOE-HDBK-3027-99, *Integrated Safety Management Systems Verification Team Leader's Handbook* – The ISM Verification Team

Leader's Handbook provides guidance on the planning, conduct, and reporting of ISM verification reviews. The requirements and guidance of this Manual should be considered by ISM verification team leaders in addition to the guidance in the Team Leader's Handbook.

(4) DEAR 970.5223-1, *Integration of environment, safety, and health into work planning and execution* – The ISM DEAR clause provides requirements for DOE contractors regarding the development, implementation, and maintenance of ISM systems. The Contractor Requirements Document in this Manual is intended to supplement the requirements in the DEAR clause and only apply to those contractors for which the DEAR clause is already applicable.

Other DOE directives, such as the Oversight Order (DOE O 226.1, *Implementation of Department of Energy Oversight Policy*), the Quality Assurance Order (DOE O 414.1C, *Quality Assurance*), the Environmental Protection Program Order (DOE O 450.1, *Environmental Protection Program*), the Nuclear Safety Management rule (10 CFR 830), and the Worker Health and Safety Program rule (per 10 CFR 851, Worker Safety and Health Program) contain related and overlapping requirements and responsibilities with the ones contained in this Manual. This Manual requires DOE offices to understand and integrate these related programs.

2. REFERENCES.

a. DOE O 151.1C, *Comprehensive Emergency Management System*, dated 11-2-05.

b. DOE P 226.1, *Department of Energy Oversight Policy*, dated 6-10-05.

c. DOE O 226.1, *Implementation of Department of Energy Oversight Policy*, dated 9-15-05;

d. DOE O 414.1C, *Quality Assurance*, dated 6-17-05.

e. DOE G 414.1-1A, *Management Assessment and Independent Assessment Guide*, dated 5-21-01.

f. DOE M 411.1-1C, *Safety Management Functions, Responsibilities, and Authorities Manual*, dated 12-31-03 (DOE FRAM).

g. DOE O 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees*, dated 3-27-98.

h. DOE O 450.1 Chg 2, *Environmental Protection Program*, dated 12-07-05.

i. DOE G 450.1-1A, *Implementation Guide for Use with DOE O 450.1, Environmental Protection Program*, dated 10-24-05.

j. DOE G 450.1-2, *Implementation Guide for Integrating Environmental Management Systems into Integrated Safety Management Systems*, dated 8-20-04.

k. DOE P 450.2A, *Identifying, Implementing and Complying with Environment, Safety and Health Requirements*, dated 5-15-96.

l. DOE P 450.4, *Safety Management System Polic*y, dated 10-15-96.

m. DOE G 450.4-1B, *Integrated Safety Management System Guide for Use with Safety Management System Policies (DOE P 450.4, DOE P 450.5, and DOE P 450.6); the Functions, Responsibilities, and Authorities Manual; and the DOE Acquisition Regulation*, dated 3-1-01.

n. DOE P 450.7, *Environment, Safety and Health (ES&H) Goals*, dated 8-2-04.

o. DOE Implementation Plan to Improve Oversight of Nuclear Operations (in response to Defense Nuclear Facilities Safety Board Recommendation 2004-1), Revision 2, dated 10-12-06.

p. Public Law (P.L.) 106-65, Title 32, National Defense Authorization Act for FY 2000, as amended, which established the NNSA as a separately organized agency within the Department of Energy.

q. DOE-HDBK-3027-99, *Integrated Safety Management Systems Verification Team Leader's Handbook*, June 1999.

r. DEAR 970.5223-1, *Integration of environment, safety, and health into work planning and execution*.

s. 10 CFR 830, Nuclear Safety Management.

t. 10 CFR 851, Worker Safety and Health Program.

3. RESPONSIBILITIES.

a. Secretary.

(1) Establish and communicate expectations to ensure the safe and environmentally sound operation of Department facilities.

(2) Maintain a broad awareness of the status of ISM implementation throughout the Department, and take necessary actions to improve implementation effectiveness.

b. Deputy Secretary.

(1) Establish and communicate expectations to ensure the safe operation of Department facilities.

(2) Establish and approve DOE safety goals and objectives.

(3) Maintain a broad awareness of the status of ISM implementation throughout the Department, and take necessary actions to improve implementation effectiveness.

(4) Designate the DOE ISM Champion to lead the DOE ISM Champions Council, which reports through the Chief Health, Safety and Security Officer to the Deputy Secretary (see Attachment 5).

c. Under Secretary of Energy, Administrator of National Nuclear Security Administration (NNSA) and Under Secretary for Science.

(1) Establish and communicate expectations to ensure the safe operation of Department facilities.

(2) Establish and approve safety goals and objectives for their organization.

(3) Maintain a broad awareness of the status of ISM implementation throughout their organization, and take necessary actions to improve implementation effectiveness.

d. Central Technical Authorities. (Note: The Department has established three Central Technical Authorities (CTAs), for NNSA (Principal Deputy Administrator), Energy (Under Secretary of Energy), and for science (Under Secretary for Science). The CTA responsibilities are reflected in the DOE FRAM).

(1) Review ISM system descriptions, annual ISM reviews, declarations, and performance objectives, measures and commitments for Secretarial offices under their purview.

(2) Provide observations and recommendations to Secretarial Officers and Field Office Managers to improve ISM effectiveness with regard to nuclear safety.

(3) Review concerns with meeting implementation schedule targets that are identified by Secretarial offices under their purview (in accordance with Chapter II, paragraph 1.a).

e. Secretarial Officers. (Note: For the purposes of this Manual, specific responsibilities for the Secretary, the Deputy Secretary, and the Under Secretary of Energy are delineated separately in this section. The responsibilities below apply to all other Secretarial Officers with responsibilities for safety management at DOE facilities.)

(1) Develop, approve, maintain, and implement Secretarial office ISM systems, as described in ISM system descriptions, which are complete,

accurate and up-to-date; provide Secretarial office ISM system descriptions to the Central Technical Authority for information (Note: HSS will provide its ISM system description to the Deputy Secretary).

(2) Integrate EMS and QAP into Secretarial office and field office ISM systems, pursuant to DOE O 450.1, *Environmental Protection Program*, and DOE O 414.1C, *Quality Assurance*.

(3) Conduct line oversight of the implementation of ISM at field offices assigned to the Secretarial office, consistent with the requirements and guidance of DOE O 226.1, *Implementation of Department of Energy Oversight Policy*, and Attachment 4 of this Manual, *Guidelines for Improving DOE ISM System Implementation.*

(4) Perform an annual ISM effectiveness review, and using the results of this review, make an annual declaration of the status of ISM implementation within the Secretarial office to the next level of DOE management (Deputy Secretary for HSS, and CTAs for NNSA, EM, and NE, Under Secretary for Science for SC).

(5) Approve annual safety performance objectives, measures, and commitments and provide to the cognizant Central Technical Authority (Note: HSS will provide these to the Deputy Secretary).

(6) Designate an ISM Champion to support ISM implementation activities as directed.

(7) Use results from annual ISM reviews and declarations to drive ownership and improvement by providing clear, timely, and accurate feedback, including identifying new goals and directions for improvement in the following year, good practices and lessons learned for effective ISM implementation, inputs to the annual planning and budgeting cycle, goal setting as in the DOE Management Challenges, and performance appraisals, to DOE personnel.

(8) Provide direction, including reporting dates, to field offices for annual ISM effectiveness reviews, annual ISM declarations, and annual safety performance objectives, measures, and commitments.

f. Field Office Managers. (Note: the term “field office” is used throughout to indicate the DOE field office with direct management and oversight of operational activities, which may be performed by contractors or at Government-Owned, Government-Operated (GO-GO) facility personnel. “Field offices” may have various other designations, including operations office, site office, and project office. Where multiple levels of DOE field organizations exist, applicable DOE Secretarial offices should determine in their ISM system descriptions how to apply these responsibilities.)

(1) Develop, approve, maintain, and implement field office ISM systems, as described in ISM system descriptions, which are complete, accurate and up-to-date; provide field office ISM system descriptions to the applicable Secretarial office for information.

(2) Integrate EMS and QAP into the field office ISM system, pursuant to DOE O 450.1, *Environmental Protection Program*, and DOE O 414.1C, *Quality Assurance*.

(3) Review and approve the contractor's ISM system descriptions and updates, as needed. This review includes verifying that the Contractor's ISM system effectively coordinates with the DOE field office ISM system as a condition of approval. If the contractor states that changes are not needed, then review and approve the rationale for that decision. Conduct line oversight of the field office's contractor implementation of ISM, consistent with the requirements and guidance of DOE O 226.1, *Implementation of Department of Energy Oversight Policy.*

(4) Perform an annual ISM effectiveness review and using the results of this review, make an annual declaration in writing of the status and effectiveness of ISM implementation within the field office and the contractor's organizations, and submit this declaration to the applicable Secretarial office.

(5) Prepare annual field office safety performance objectives, measures, and commitments, and provide to the applicable DOE Secretarial office.

(6) Designate an ISM Champion to support ISM implementation activities as directed.

(7) Use the results of the annual ISM effectiveness review and the annual ISM declaration to drive ownership and improvement. Communicate implementation and improvement expectations through clear, timely, and accurate feedback to DOE personnel (through performance appraisals, for example) and to contractor organizations (through contract fee determinations and contract performance objectives and incentives, for example).

(8) Provide direction, including reporting dates, to contractors for annual ISM effectiveness reviews, Annual ISM declarations, and Annual safety performance objectives, measures, and commitments.

(9) Determine whether and when to conduct full ISM verifications of field office ISM activities, encompassing both federal and contractor implementation of ISM, consistent with the guidance in Attachment 4 of this Manual, *Guidelines for Improving DOE ISM System Implementation.*

g. Contracting Officer.

(1) As directed by the field office manager, transmit feedback on contractor ISM system descriptions and annual updates, if changes are needed. (Note: Contracting officers may transmit authority for provisional approval of annual updates to the contractor after initial approval; DOE retains the responsibility this approval).

(2) As directed by the field office manager, establish and maintain the latest version of the following Department of Energy Acquisition Regulations (DEAR clauses) in applicable DOE contracts: 48 CFR 970.5223-1, "Integration of Environment, Safety, and Health into Work Planning and Execution," 48 CFR 970.5204-2 (Laws, Regulations and DOE Directives), 48 CFR 970.5215-3 (Conditional Payment of Fee, Profit, and other Incentives) and 48 CFR 970.5203-2 (Performance Improvement and Collaboration).

(3) Establish and maintain the latest version of this Manual (see Attachment 1, Contractor Requirements Document) as a requirement in all DOE contracts that already include DEAR Clause 970.5223-1, "Integration of environment, safety, and health into work planning and execution.

(4) As directed by the Field Office Manager, transmit annual direction to contractors on ISM including schedule for providing contractor submittals of (1) annual ISM effectiveness reviews and annual ISM declarations, (2) ISM system description updates, and (3) safety performance objectives, measures, and commitments.

(5) Provide contractors with the latest approved version of the applicable DOE field office ISM system description.

(6) As directed by the field office manager, transmit DOE field office feedback on contractor ISM system performance objectives, measures, and commitments.

h. Chief Health, Safety and Security Officer.

(1) Develop DOE safety policy, requirements, and guidance necessary for the effective implementation of the DOE ISM program, consistent with the Department's directives and standards systems.

(2) As part of the HSS ISM system description, describe ongoing safety initiatives in the context of DOE-wide ISM implementation and link these initiatives to ISM systems, functions, performance objectives and measures. Provide the HSS ISM system description to the Deputy

(3) Secretary and line programs so they will understand how ongoing HSS safety initiatives fit within the Department's ISM system implementation.

(4) Support improvement in ISM programs by providing technical assistance to line management.

(5) Perform periodic independent oversight of ISM implementation at all levels (i.e., DOE Headquarters Secretarial offices, DOE field offices, and DOE contractors), consistent with the requirements of DOE O 226.1, *Implementation of DOE Oversight Policy*.

(6) Provide observations and recommendations to reviewed organizations to improve ISM effectiveness, consistent with the requirements of DOE O 226.1, *Implementation of DOE Oversight Policy*.

(7) Provide an annual report to the Secretary concerning the overall status of implementation of ISM at DOE and identifying strengths, best practices, common weaknesses, and opportunities for improvement.

(8) Designate an ISM Champion to support ISM implementation activities as directed, and support the DOE ISM Champions Council in improving the effectiveness of the DOE ISM systems throughout the DOE complex.

i. Chair, ISM Champions Council (DOE ISM Champion).

(1) Lead the ISM Champions Council to fulfill the functions defined in the Charter for the ISM Champions Council (see Attachment 5).

(2) Report on the activities of the ISM Champions Council to the Deputy Secretary, through the Chief Health, Safety and Security Officer.

j. Secretarial Office and Field Office ISM Champions.

(1) Assist line management in developing and sustaining vital, mature ISM systems.

(2) Participate in the ISM Champions Council and support the DOE ISM Champion in accomplishing the council functions, as defined in the Charter for the ISM Champions Council (see Attachment 5).

CHAPTER II. REQUIREMENTS

1. DEVELOPING DOE ISM SYSTEM DESCRIPTIONS.

a. Secretarial Offices. DOE HQ Secretarial offices must develop and implement ISM systems. DOE HQ Secretarial offices must develop and maintain ISM system descriptions to ensure that they are complete, accurate and up-to-date. Each Secretarial office must issue an approved Secretarial office ISM system description within six months of the issuance of this Manual and must achieve full implementation of the system description within two years of issuance of the system description. Secretarial offices with concerns about meeting this implementation schedule due to resource constraints must develop an impact analysis, notify their responsible Central Technical Authority (for HS, notify the Deputy Secretary), request any necessary resources in the upcoming budget cycle, and provide a schedule for full implementation in their ISM system description.

(1) ISM system descriptions for DOE Secretarial offices must be approved by the responsible DOE Headquarters Secretarial Officer. These system descriptions must describe the following:

(a) how the Secretarial office defines its work activities related to achieving the ISM objective of safe mission accomplishment, as defined in DOE P 450.4, *Safety Management System Policy*;

(b) the ISM implementing mechanisms, processes and methods by which the Secretarial office implements the ISM guiding principles to create an effective environment for ISM implementation, as defined in Attachment 2;

(c) the ISM implementing mechanisms, processes and methods by which the Secretarial office implements the ISM core functions;

(d) how EMS, QAP, and other management processes and systems are integrated into the ISM system;

(e) how the Secretarial office will measure ISM effectiveness, perform annual ISM effectiveness reviews, prepare annual ISM declarations, and continuously improve the effectiveness of the ISM system;

(f) how the Secretarial office 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 system;

(g) how the Secretarial office will maintain its ISM system description so that it is accurate and up-to-date, and demonstrate continuous improvement in its performance of safe work activities; and

(h) the ISM implementing mechanisms and processes that will be used to meet the Secretarial Office responsibilities delineated in this Manual.

(2) Secretarial office ISM system descriptions must be consistent with established DOE safety directives, except where exemptions are approved. These ISM system descriptions should follow applicable DOE direction and guidance, including that found in—

(a) Attachment 3 of this Manual, Guidelines for Developing DOE ISM System Descriptions,

(b) DOE G 450.4-1B, *Integrated Safety Management System Guide*, and

(c) DOE G 450.1-2, *Implementation Guide for Integrating Environmental Management Systems into Integrated Safety Management Systems*.

(3) Each ISM system description will be the primary management system description for the particular Secretarial office for accomplishing work in a safe and environmentally sound manner, and must be integrated with the corresponding Secretarial office Quality Assurance programs (see existing requirement in DOE O 414.1C, *Quality Assurance*) and other relevant safety and management systems, such as emergency management systems (see DOE O 151.1C, *Comprehensive Emergency Management System*). Each Secretarial office ISM system must be integrated with the office business processes for work definition and planning, budgeting, authorization, execution, financial management and control, change control, performance measurement, and performance evaluation incorporating lessons learned and continuous improvement. For example, ISM accountabilities and performance should be reflected in employee performance objectives and evaluations. Secretarial office ISM system descriptions may be combined into a single document or a set of documents that also include the associated Secretarial office's functions, responsibilities and authorities document, the quality assurance plan, and the line oversight program description.

ISM system descriptions must be reviewed at least annually to determine whether updates are needed. If no changes are needed to maintain ISM system description complete, accurate, and up-to-date, then no annual update is necessary. A statement to this effect should be included in the annual ISM declaration. If changes are needed, these will be approved by

the Secretarial Officer and provided for information to the applicable Central Technical Authority or applicable senior DOE official.

(4) Secretarial offices must establish and maintain implementing mechanisms, including processes, policies, protocols, procedures, documentation, and training, to translate ISM system expectations into implementation activities and desired human behaviors. These mechanisms must address all active and applicable facility life-cycle phases including design, construction, operation, and decontamination and decommissioning.

(5) The level of rigor in the ISM System Descriptions must be consistent with the hazards and complexity of the applicable facilities and activities.

b. Field Offices. DOE field offices (including NNSA site offices and EM project offices) must develop and implement ISM systems. They must develop and maintain approved ISM system descriptions that are complete, accurate and up-to-date. Each Field office must issue an approved Field Office ISM system description within six months of the issuance of the applicable DOE Secretarial office ISM system description and must achieve full implementation of the system description within one year of issuance of the field office system description. Field offices with concerns about meeting this implementation schedule due to resource constraints must develop an impact analysis, notify their responsible Secretarial Office, request any necessary resources in the upcoming budget cycle, and provide a schedule for full implementation in their ISM system description.

(1) ISM system descriptions for DOE field offices must be provided for information to the responsible Secretarial office. These systems descriptions will describe the following:

(a) how the field offices define work activities related to achieving the ISM objective of safe mission accomplishment, as defined in DOE P 450.4, *Safety Management System Policy*.

(b) the ISM implementing mechanisms, processes and methods by which the field office implements the ISM guiding principles to create an effective environment for ISM implementation, as defined in Attachment 2.

(c) the ISM implementing mechanisms, processes and methods by which the field office implements the five ISM core functions.

(d) how EMS, QAP, and other management systems and processes are integrated into the ISM system.

(e) how the field office will measure ISM effectiveness, perform annual ISM effectiveness reviews, prepare annual ISM

declarations, and continuously improve the effectiveness of the ISM system.

(f) how the field office will establish, document, and implement relevant safety performance objectives, measures, and commitments in response to Secretarial and budget execution guidance while maintaining the integrity of the system.

(g) how the field office will maintain its ISM system description so that it is accurate and up-to-date, and demonstrate continuous improvement in its performance of safe work activities.

(h) the ISM implementing mechanisms and processes that will be used to meet the field office responsibilities delineated in this Manual.

(2) Field office ISM system descriptions must be consistent with established DOE safety directives, except where exemptions are approved. Field office ISM system descriptions should also be consistent with the associated Secretarial office ISM system description(s). Field office ISM system descriptions should follow applicable DOE direction and guidance, including that found in—

(a) Attachment 3 of this Manual, Guidelines for Developing DOE ISM System Descriptions,

(b) DOE G 450.4-1B, *Integrated Safety Management System Guide*, and

(c) DOE G 450.1-2, *Implementation Guide for Integrating Environmental Management Systems into Integrated Safety Management Systems*.

(3) Each field office's ISM system description will be the primary management system description for the field office for accomplishing work in a safe and environmentally sound manner, and must be integrated with the Quality Assurance program (see existing requirement in DOE O 414.1C, *Quality Assurance*) and other relevant safety and management systems, such as emergency management systems (see DOE O 151.1C, *Comprehensive Emergency Management System*). Each field office system must be integrated with the office's business processes for work definition and planning, budgeting, authorization, execution, financial management and control, change control, performance measurement, and performance evaluation. Field office ISM system descriptions may be combined into a single document or a set of documents that also include the field office functions, responsibilities and authorities document, the quality assurance plan, and the line oversight program description.

(4) Field office ISM system description will be reviewed at least annually to determine whether updates are needed. If no changes are needed to maintain ISM system description complete, accurate, and up-to-date, then no annual update is necessary. A statement to this effect should be included in the annual ISM declaration. If changes are needed, these will be approved by the field office manager, and provided for information to the applicable Secretarial officer.

(5) Field offices must establish and maintain implementing mechanisms, including processes, policies, protocols, procedures, documentation, and training, to effectively translate ISM system expectations into implementation activities and desired human behaviors.

(6) The level of rigor in the ISM System Descriptions must be consistent with the hazards and complexity of the applicable facilities and activities.

2. IMPROVING DOE ISM SYSTEM IMPLEMENTATION. Guidelines for improving DOE ISM system implementation are provided in Attachment 4. DOE G 414.1-1A, *Management Assessment and Independent Assessment Guide,* also provides useful guidance on a variety of assessments required below.

a. Line Oversight. DOE Secretarial offices and field offices will perform line oversight of ISM implementation at the next lower tier, consistent with the requirements and guidance of DOE O 226.1, *Implementation of Department of Energy Oversight Policy*. DOE Secretarial offices will oversee implementation at the field office level, with sampling at the contractor level, as needed based on available performance information, to evaluate the effectiveness of the field office. DOE Field offices will oversee implementation at the contractor level.

b. Annual ISM Effectiveness Reviews and Annual ISM Declarations.

(1) DOE Secretarial offices and field offices will perform an annual ISM effectiveness review to develop their annual ISM declarations. The annual ISM review will encompass a review of the content and results of relevant self-assessments, line oversight, lower-level ISM reviews, and the annual integrated review of lower-level ISM reviews; a review of performance against the past year's safety performance objectives, measures, and commitments; and pertinent feedback data from a variety of relevant mechanisms. Guidelines for performing annual ISM effectiveness reviews are provided in Attachment 4.

(2) DOE Secretarial offices and field offices will annually issue a declaration report of the status of implementation of ISM within that office, including applicable site and contractor operations. The DOE Secretarial offices must evaluate applicable DOE Headquarters and field office activities, and applicable contractor activities; and the DOE field offices must evaluate

applicable DOE field office activities and applicable contractor activities. The report must include:

(a) a summary of relevant activities and assessments that were completed during the year and provide the basis for the determination of overall ISM effectiveness;

(b) a determination of the overall effectiveness of implementation of ISM, using one of these summary evaluations: "Effective Performance," "Needs Improvement," or "Significant Weakness";

(c) summary of strengths, weaknesses, and opportunities for improvement;

(d) planned or ongoing actions to enhance ISM effectiveness;

(e) a discussion of potential site vulnerabilities to provide an opportunity to develop and implement risk management options and strategies, including re-scoping activities, re-allocating funds and resources to address the vulnerabilities, or identifying the consequences of proceeding without addressing them; and

(f) any directive exemptions per changes in the contract during the year.

(3) Annual ISM declarations must provide the bases for their conclusions. These bases should include the annual ISM effectiveness review, self-assessments, line oversight reviews, annual integrated ISM reviews, lower-level ISM reviews, pertinent feedback data from a variety of mechanisms, and action plans including corrective or compensatory actions to address weaknesses and opportunities for improvement.

(4) For Secretarial offices, the annual ISM declarations must be provided to the applicable Central Technical Authority or designated senior official. For field offices, annual ISM declarations must be provided to the applicable Secretarial office for review.

c. Annual Performance Expectations and Performance Objectives. DOE HQ Secretarial offices will annually prepare safety performance objectives, measures, and commitments, and provide these to the applicable CTA or DOE senior official over the office (the Deputy Secretary for HSS, the NNSA CTA for NNSA, the Energy CTA for EM and NE, etc.). DOE field offices will annually prepare and submit safety performance objectives, measures, and commitments, and provide these for information to the applicable HQ Secretarial office.

d. Full ISM Verifications. DOE field offices will determine whether and when to conduct full ISM verifications of field office ISM activities, including both

federal and contractor implementation of ISM, in accordance with the guidance provided in Attachment 4 of this Manual, *Guidelines for Improving DOE ISM System Implementation.*

e. ISM Champions Council. DOE Secretarial Officers and Field Element Managers must designate their ISM Champions and identify their Champion to their organizations and to the DOE ISM Champion. The DOE ISM Champions Council will operate in accordance with its Charter, provided in Attachment 5.

APPENDIX A

ACRONYMS AND ABBREVIATIONS

ASME	American Society of Mechanical Engineers
BBS	Behavior Based Safety
CAIRS	Computerized Accident/Incident Reporting System
CCE	Continuing Core Expectation
CFR	Code of Federal Regulations
COO	Conduct Of Operations
Council	DOE ISM Champions Council
CRAD	Criteria and Review Approach Document
CRD	Contractor Requirements Document
CTA	Central Technical Authority
DEAR	Department of Energy Acquisition Regulation
DNFSB	Defense Nuclear Facilities Safety Board
DOE	Department of Energy
DOE G	Department of Energy Guide
DOE-HDBK	Department of Energy Handbook
DOE M	Department of Energy Manual
DOE O	Department of Energy Order
DOE P	Department of Energy Policy
DS	Deputy Secretary of Energy
EM	DOE Office of Environmental Management
EMS	Environmental Management System
ES&H	Environment, Safety and Health
EWP	Enhanced Work Planning
FRA	Functions, Responsibilities and Authorities
FRAM	Functions, Responsibilities, and Authorities Manual
GO-GO	Government-Owned, Government-Operated
HDBK	Handbook
HPI	Human Performance Improvement
HQ	(DOE) Headquarters
HRO	High-Reliability Organization
HSS	Office of Health, Safety and Security
IAEA	International Atomic Energy Agency
INPO	Institute for Nuclear Power Operations

ISM	Integrated Safety Management
ISO	International Standards Organization
ISSM	Integrated Safeguards and Security Management
NE	DOE Office of Nuclear Energy
NNSA	National Nuclear Security Administration
NRC	Nuclear Regulatory Commission
OSHA	Occupational Safety and Health Administration
ORPS	Occurrence Reporting and Processing System
PAAA	Price Anderson Amendments Act
QA	Quality Assurance
QAP	Quality Assurance Program
SC	DOE Office of Science
TSR	Technical Safety Requirement
US	Under Secretary of Energy
VPP	Voluntary Protection Program

APPENDIX B
GLOSSARY OF TERMS

ACTIVE ERROR—Human action (behavior) that changes equipment, system, or plant state triggering immediate undesired consequences.

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

ALIGNMENT—A measure or judgment of the extent to which the values, processes, management, and existing factors within an organization influence human performance in a complementary and non-contradictory way; facilitating organizational processes and values to support desired behavior.

ANNUAL ISM DECLARATION—A determination by a DOE or contractor organization regarding whether it is in full conformance with the requirements and expectations for an effective Integrated Safety Management system and its bases for this determination. An annual ISM declaration must be based on an annual ISM effectiveness review.

ANNUAL ISM EFFECTIVENESS REVIEW—An annual review conducted by a DOE or contractor organization for determining whether its Integrated Safety Management System is in full conformance with the requirements and expectations for effective implementation. The annual ISM effectiveness review is a qualitative review that encompasses multiple elements, including review of: self-assessments, oversight reviews results, integrated reviews across multiple reporting elements; performance against established performance objectives, measures, and commitments; and other feedback and performance information.

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

AUTHORIZATION BASIS—Those aspects of the facility design basis and operational requirements relied upon by DOE to authorize operation. These aspects are considered important to the safety of facility operations. The authorization basis is described in documents such as the facility Safety Analysis Report and other safety analyses; Hazard Classification Documents, the Technical Safety Requirements, DOE-issued safety evaluation reports, and facility-specific commitments made in order to comply with DOE Orders or policies.

BEHAVIOR—(1) Observable (movement, speech) and unobservable (perception, thought, decisions not to act or *inaction*, emotional response, and so forth) activity by an individual; (2) The mental and physical efforts to perform a task.

BEHAVIOR BASED SAFETY—A proactive approach to injury prevention that focuses on at-risk behaviors that can lead to an injury -or on safe behaviors that can contribute to injury prevention.

BEST PRACTICES—Management practices and work processes that lead to world-class, superior performance.

CAUSAL ANALYSIS—A process used to analyze an incident and determine the actual factors that caused the incident, thus identifying which factors if corrected would prevent the recurrence of the incident.

CENTRAL TECHNICAL AUTHORITY—The Department has established three Central Technical Authorities (CTAs) for NNSA, Energy (including EM and NE), and Science. Each CTA is a line management executive who will be responsible for the following core nuclear safety functions for their organizations and facilities: (1) concurs with the determination of the applicability of DOE Directives involving nuclear safety included in contracts; (2) concurs with nuclear safety requirements included in contracts; (3) concurs with all exemptions to nuclear safety requirements in contracts that were added to the contract; (4) recommends issues and proposed resolutions concerning DOE safety requirements, concurs in the adoption or revision of nuclear safety requirements (including supplemental requirements), and provides expectations and guidance for implementing nuclear safety requirements as necessary for use by DOE employees and contractors; (5) maintains operational awareness of the implementation of nuclear safety requirements and guidance, consistent with the principles of ISM across the DOE complex (including, for example, reviewing Documented Safety Analyses, Authorization Agreements and readiness reviews as necessary to evaluate the adequacy of safety controls and implementation); (6) periodically reviews and assesses whether DOE is maintaining adequate numbers of technically competent personnel necessary to fulfill nuclear safety responsibilities; and, (7) provides inputs to, reviews, and concurs with DOE-wide nuclear safety related research and development activities.

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

CONSERVATIVE DECISION MAKING—Reaching conclusions by placing value on facility safety above the production goals of the station. Facility results demonstrate recognition and avoidance of activities that unnecessarily reduce safety margins.

CONTRACTING OFFICER—A person with authority to enter into, administer, and terminate contracts and make related determinations and findings; includes certain authorized representatives of the contracting officer acting within the limits of authority as delegated by the contracting officer. [DOE O 541.1B]

CONTROLS—Administrative and engineering mechanisms that can affect the chemical, physical, metallurgical or nuclear process of a nuclear facility in such a manner as to effect the protection of the health and safety of the public and workers, or the protection of the environment. Also, error-prevention techniques adopted to prevent error and to recover from or mitigate the effects of error; to make an activity or process go smoothly, properly, and according to high standards. Multiple layers of controls provide defense in depth.

CONTRACTOR—Any entity under contract with the Department of Energy with the responsibility to perform activities at a DOE site or facility. [10 CFR 835.2]

CORE FUNCTIONS (or ISM CORE FUNCTIONS)—The core safety management functions are defined in DOE P 450.4, *Safety Management System Policy*, to be: (1) define the scope of work; (2) analyze the hazards; (3) develop and implement hazard controls; (4) perform work within controls; and (5) provide feedback and continuous improvement. These functions are also identified in DEAR 48 CFR 970.5223-1(c).

CULTURE—An organization's system of commonly held values and beliefs that influence the attitudes, choices and behaviors of the individuals of the organization.

DEFENSE IN DEPTH - An approach to facility safety that builds in layers of defense against release of or exposure to hazardous materials so that no one layer by itself, no matter how good, is completely relied upon. To compensate for potential human and mechanical failures, defense in depth is based on several layers of protection with successive barriers to prevent the release of or exposure to hazardous materials. This approach includes protection of the barriers to avert damage to the plant and to the barriers themselves. It includes further measures to protect the public, workers, and the environment from harm in case these barriers are not fully effective. Defense in depth controls include engineering controls, administrative processes, and personnel staffing and capabilities.

DEVIANCE—See NORMALIZATION OF DEVIANCE.

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

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

ENVIRONMENTAL MANAGEMENT SYSTEM—The part of the overall management system that includes organization structure, planning activities, responsibilities, practices, procedures, processes, and resources for developing, integrating, achieving, reviewing, and maintaining, environmental policy; a continuing cycle of planning, implementing, evaluating, and improving processes and actions undertaken to achieve environmental goals.

ERROR—An action that unintentionally departs from an expected behavior.

ERROR-LIKELY SITUATION—A work situation in which there is greater opportunity for error when performing a specific action or task due to error precursors (also known as "error trap").

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

GUIDING PRINCIPLES (or ISM GUIDING PRINCIPLES)—Conditions for performance of work that an integrated safety management system must address. The guiding principles are defined in DOE P 450.4, *Safety Management System Policy,* to be: (1) Line management Responsibility for Safety, (2) Clear Roles and Responsibilities, (3) Competence Commensurate with Responsibilities, (4) Balanced Priorities, (5) Identification of Safety Standards and Requirements, (6) Hazard Controls Tailored to Work Being Performed, and (7) Operations Authorization. These principles are also identified in DEAR 48 CFR 970.5223-1(b).

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

HAZARD CONTROLS—Measures to eliminate, limit, or mitigate hazards to workers, the public, or the environment, including (1) physical, design, structural, and engineering features; (2) safety structures, systems, and components; (3) safety management programs; (4) technical safety requirements; and (5) other controls necessary to provide adequate protection from hazards.

HIERARCHY OF CONTROLS - The following hierarchy of defense in depth controls is recognized and applied: (1) elimination or substitution of the hazards, (2) engineering controls, (3) work practices and administrative controls, and (4) personal protective equipment. Inherently safe designs are preferred over ones requiring engineering controls. Prevention is emphasized in design and operations to minimize the use of, and thereby possible exposure to, toxic or hazardous substances.

HIGH-RELIABILITY ORGANIZATION—Organizations that consistently operate under trying and hazardous conditions, and manage to have relatively few accidents. These organizations operate in settings where the potential for error and disaster is very high. They have no choice but to function reliably because failure results in severe consequences. HRO theory holds that significant accidents can be prevented through proper management of prevention and mitigation activities. Examples of high-reliability organizations: nuclear aircraft carriers, nuclear power generating plants, power grid dispatching centers, air traffic control systems, aircraft operations, hospital emergency departments, hostage negotiating teams, firefighting crews, continuous processing firms. HRO characteristics include: (1) personal technical excellence and commitment to continuous training: (2) sustained, high levels of operational performance, encompassing both productivity and safety objectives; (3) robust technical systems and structures, and organizational processes that provide redundancy and

flexibility; (4) decentralized authority patterns, including deference to capable individuals with the most technical expertise and individuals closest to the problem; (5) a committed workforce where every individual understands and accepts their roles and responsibilities for safe mission performance; (6) a deep commitment to continuous performance improvement, openness and trust, and cultivation of a continuous learning environment; and (7) the use of systems of checks and audits to build reliability.

HUMAN ERROR—A phrase that generally means the slips and mistakes of humankind. See also active error and latent error.

HUMAN PERFORMANCE—(1) Individual sense: A series of behaviors executed to accomplish specific task objectives (results); (2) Organizational sense: The sum of what people (individuals, leaders, managers) are doing and what people have done; the aggregate system of processes, influences, behaviors, and their ultimate results that eventually become manifest in the physical plant.

HUMAN PERFORMANCE IMPROVEMENT—Human Performance Improvement is fundamentally about reducing errors and managing defenses. Striving for excellence in human performance is an ongoing effort to reduce events caused by human error. Human error is caused by a variety of conditions related to individual behavior, management and leadership practices, and organizational processes and values. Behaviors at all levels need alignment to improve individual performance, reduce errors and prevent events. Alignment involves facilitating organizational processes and values to support desired behaviors.

INTEGRATED SAFETY MANAGEMENT—The DOE approach for systematically integrating safety into management and work practices at all levels so that missions are accomplished while protecting the public, the worker, and the environment.

INTEGRATED SAFETY MANAGEMENT SYSTEM—A safety management system that provides a formal, organized process whereby people plan, perform, assess, and improve the safe conduct of work efficiently and in a manner that ensures protection of workers, the public, and the environment. This management system is used to implement ISM to systematically integrate safety into management and work practices at all levels so that missions are accomplished while protecting the public, the worker, and the environment.

ISM CHAMPION—DOE employees designated to support their line management in implementing ISM and serving on the ISM Champions Council. The DOE ISM Champion is designated by the Deputy Secretary and chairs the ISM Champions Council. Each DOE Secretarial office and field office designates an ISM Champion to support them in ISM implementation activities.

ISM CHAMPIONS COUNCIL—The Council chartered to support line management in developing and sustaining vital, mature ISM systems throughout the Department. The Council promotes continuous learning and improvement of ISM effectiveness throughout the DOE complex.

ISO STANDARD 14001—Internationally recognized voluntary environmental management system standard that provides organizations with the elements of an effective environmental management system that can be integrated with other management requirements to help organizations to achieve environmental and economic goals.

JUST CULTURE—A culture that understands and values the distinction between blame-free and culpable actions, and does not seek to punish errors that are unintentional and reasonable given the context. In a just culture, line managers demonstrate an understanding that humans are fallible and when mistakes are made, the organization seeks first to learn as opposed to blame. In a just culture, employees are more likely to report errors, near-misses, and error-likely situations, which help the organization to learn and improve.

LAGGING INDICATOR (or OUTCOME INDICATOR)—A parameter or measure, changes in which provide information about previous performance as reflected in events, observations, problem reports, and similar occurrences.

LATENT ERROR—An error, act, or decision that results in organization-related weaknesses or equipment flaws that lie dormant until revealed either by human error, testing, or self-assessment.

LATENT ORGANIZATIONAL WEAKNESSES—Loopholes in the system's defenses, barriers, and safeguards whose potential existed for some time prior to the onset of the accident sequence, though usually without any obvious bad effect. These loopholes consist of imperfections in features such as leadership/supervision, training and qualification, report of defects, engineered safety features, safety procedures, and hazard identification and evaluation. Most accidents originate from or are propagated by latent weaknesses.

LEADING INDICATOR (or Process Indicator)—A parameter or measure, changes in which are frequently followed by a correlated change in one or more other performance measures some time later; provides information about developing or changing conditions upstream in the organization that tend to influence future human performance at the job site.

LEARNING ORGANIZATION—One that values continuous learning. An organization that is deeply committed to continuous performance improvement and develops and sustains organizational processes, such as incident critiques, that facilitate continuous improvement; encourage openness and trust so that problems are reported; cultivate an environment that encourages and rewards ongoing efforts to learn from experience, learn from others, and from self-directed studies; aggressively seek to know what it doesn't know; demonstrate excellence in performance monitoring, problem analysis, solution planning, and solution implementation; systematically eliminate or mitigate error-likely situations; and remain obsessed with the liabilities of success.

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

MENTAL MODEL—Structured organization of knowledge a person has about how something works (usually in terms of generalizations, assumptions**,** pictures, or key words). Mental models may be deeply ingrained and even unconscious.

MINDFULNESS—The combination of ongoing scrutiny of existing expectations, continuous refinement and differentiation of expectations based on newer experiences, willingness and capability to invent new expectations that make sense of unprecedented events, a more nuanced appreciation of context and ways to deal with it, and identification of new dimensions of context that improve foresight and current functioning. Mindfulness is a pre-occupation with updating. Mindful people accept the reality of ignorance and work hard to smoke it out, knowing full well that each new answer uncovers a host of new questions. Mindfulness is exhibited by high reliability organizations through the following five hallmarks of reliability: (1) preoccupation with failure, (2) reluctance to simplify interpretations, (3) sensitivity to operations, (4) commitment to resilience, and (5) deference to expertise. [Reference: Weick & Sutcliffe]

NORMALIZATION OF DEVIANCE—The tendency to redefine and accept previously-unexpected anomalies over time as expected events and ultimately as acceptable risks. Diane Vaughan developed this term based on her study of the O-ring failures in the Challenger accident. In this accident, "the range of expected error enlarged from the judgment that it was normal to have heat on the primary O-ring, to normal to have erosion on the primary O-ring, to normal to have gas blowby, to normal to have blowby reaching the secondary O-ring, and finally to the judgment that it was normal to have erosion on the secondary O-ring."

PERFORMANCE INDICATOR—Operational information indicative of the performance or condition of a facility, group of facilities, site, or process. (See also leading and lagging indicator.)

QUESTIONING ATTITUDE—An attitude that encourages a person's foresight to precede his or her action such that planning, judgment, and decision-making are appropriate for the situation.

SAFETY—In ISM, the term "safety" is used synonymously with environment, safety, and health (ES&H) to encompass protection of the public, the workers, and the environment [DOE P 450.4]. Safety is a dynamic non-event; a stable outcome produced by constant adjustments to system parameters. To achieve stability, change in one system parameter must be compensated for by changes in other parameters, through a process of continuous mutual adjustment [Reference: Weick & Sutcliffe].

SAFETY CULTURE—The safety culture of an organization is the product of individual and group values, attitudes, competencies, and patterns of behavior that determine the commitment to, and the style and proficiency of, an organization's health and safety programs. Organizations with a positive safety culture are characterized by communications founded on mutual trust, by shared perceptions of the importance of safety, and by confidence in the efficacy of preventive measures. The term safety culture entered public awareness through the vocabulary of nuclear safety after the Chernobyl nuclear power plant explosion.

SAFETY PERFORMANCE OBJECTIVES, MEASURES, AND COMMITMENT—Safety performance objectives are long-term management system goals. Safety performance

commitments are specific actions that will be taken during a specific year to further achievement of long-term performance objectives. Performance commitments would be expected to address significant identified weaknesses or areas for improvement. These may include either major corrective actions or major improvement actions. Safety performance measures are used to monitor achievement of performance objectives and commitments.

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

SECRETARIAL OFFICER—Secretarial Officers are: the Secretary, Deputy Secretary, and Under Secretaries; and the Assistant Secretaries and Staff or Program Office Directors reporting to the Secretary either directly or through the Deputy Secretary or Under Secretaries. The NNSA Administrator and Deputy Administrators are Secretarial Officers.

SELF-ASSESSMENT—A review, analysis or evaluation, that can be informal or formal and structured, of a program or management system performed by the organization responsible for the program or system to determine whether its implementation is in conformance with established requirements and/or defined expectations.

SITUATIONAL AWARENESS—The mental activity of developing and maintaining an accurate mental model of the facility state and the work situation based on knowledge of critical parameters, observations of system or equipment condition, work environment, team members, and recall of fundamental knowledge of the facility.

STANDARD—

A. The term "standard," or "technical standard" as cited in Public Law 104-113, includes all of the following:

1. Common and repeated use of rules, conditions, guidelines or characteristics for products or related processes and production methods, and related management system practices.

2. The definition of terms; classification of components; delineation of procedures; specification of dimensions, materials, performance, designs, or operations; measurement of quality and quantity in describing materials, processes, products, systems, services, or practices; test methods and sampling procedures; or descriptions of fit and measurements of size or strength.

B. The term "standard" does not include the following:

1. Professional standards of personal conduct.

2. Institutional codes of ethics.

SUPPLEMENTAL SAFETY CULTURE ELEMENTS—Four elements, to supplement the original seven ISM guiding principles, to help organizations to develop the appropriate context or environment for effective implementation of ISM systems: (1) Individual Attitude and Responsibility for Safety, (2) Operational Excellence, (3) Oversight for Performance Assurance, and (4) Organizational Learning for Performance Improvement.

VIOLATION—Deliberate, intentional acts to evade a known policy or procedure requirement for personal advantage usually adopted for fun, comfort, expedience, or convenience.

VOLUNTARY PROTECTION PROGRAM—The Department of Energy Voluntary Protection Program (DOE-VPP), which promotes safety and health excellence through cooperative efforts among labor, management, and government at DOE contractor sites. Closely paralleling the Occupational Safety and Health Administration Voluntary Protection Program the DOE program identified where DOE contractors and subcontractors can go beyond compliance with DOE Orders and OSHA standards. The program encourages the creative stretch for excellence through systematic approaches and cooperative efforts at the DOE sites. Requirements for participation are based on comprehensive management systems, with employees actively involved in assessing, preventing, and controlling the potential health and safety hazards at the site. The formal program provides recognition of the various levels of excellence with the DOE VPP STAR being awarded for truly outstanding protection of employee safety and health.

CONTRACTOR REQUIREMENTS DOCUMENT
DOE M 450.4-1, *Integrated Safety Management System Manual*

Regardless of the performer of the work, the contractor is responsible for complying with the requirements of this Contractor Requirements Document (CRD) and flowing down CRD requirements to subcontractors at any tier to the extent necessary to ensure contractor compliance.

The primary source of requirements for contractors regarding implementation of ISM is DEAR 970.5223-1, *Integration of environment, safety, and health into work planning and execution.* Guidance for contractor implementation is provided in DOE G 450.4-1B, *Integrated Safety Management System Guide,* dated 3-1-01. The requirements in this CRD supplement the existing DEAR clause requirements. As directed by the contracting officer, the contractor must meet the following requirements.

1. RESPONSIBILITIES.

   Contractors are required to implement an effective ISM system for the facilities they operate. The Department also requires integration of Quality Assurance (QA) and Environmental Management System (EMS) into ISM systems, as delineated in DOE O 414.1C, *Quality Assurance* and DOE O 450.1, *Environmental Protection Program*. The contractor must comply with the following requirements to ensure establishment of implementing procedures for the provisions of the Contractor Requirements Document (CRD), compliance with applicable requirements, and effective and efficient performance.

2. REQUIREMENTS.

   a. Develop a contractor ISM system description and submit it for field office approval (Note: this is an existing DEAR clause requirement repeated for continuity). Maintain cognizance of the associated DOE field office's ISM system description, as provided by the DOE contracting officer.

   b. Support DOE in implementing this Manual through submittals of (1) annual ISM effectiveness reviews and annual ISM declaration reports on ISM effectiveness, (2) ISM system description updates, if changes are needed, and (3) safety performance objectives, measures, and commitments, in accordance with time schedules established by the DOE.

   c. Clearly describe the contractor's ISM maintenance and continuous improvement processes (i.e., annual ISM effectiveness reviews, annual ISM declaration reports, ISM system description reviews and updates, and annual updates to the safety performance objectives, measures, and commitments) in the contractor's ISM system description.

   d. Establish and implement a program and process for identifying potential site-wide improvement opportunities relative to ISM (both within and beyond the contractor's scope) and reporting them to the applicable DOE field office manager. This may be done as part of the annual declaration report.

**ISM PRINCIPLES AND ATTRIBUTES
FOR EFFECTIVE ISM IMPLEMENTATION**

1. BACKGROUND AND INTRODUCTION.

a. In 1996, the Department defined the Integrated Safety Management (ISM) system as its programmatic framework for accomplishing work safely. Ten years of implementation experience have proven that ISM is a fundamentally sound safety management approach with broad applicability. The ISM concept is also well supported by Department personnel and contractors. The Department is committed to ISM as its enduring framework for performing work in a safe and environmentally sound manner. [Note: In ISM, the term "safety" is used synonymously with environment, safety, and health (ES&H) to encompass protection of the public, the workers, and the environment.]

b. During 2004, the Department recognized and acknowledged the need to revitalize ISM implementation. This need to revitalize or reinvigorate ISM is due to two factors:

(1) incompleteness and inconsistencies in implementing ISM principles and functions in programs, sites, offices, and facilities throughout the complex, and

(2) a general waning of attention to and use of ISM as it was intended to create and sustain continuous, measurable improvement.

c. In addition, the Department has recognized that ongoing maturation of ISM systems at some sites and facilities enables the associated organizations to shift focus and expected outcomes from primarily compliance to a balance of compliance and operational excellence.

d. To address inconsistencies in implementation, the Department has targeted three long-recognized weaknesses for renewed attention:

(1) work planning and control,

(2) feedback and improvement processes, and

(3) ISM system description and implementation by DOE federal organizations.

e. To help reinvigorate the use of ISM as the guiding framework for organizational performance improvement, this attachment seeks to describe the context or environment that ISM systems must create and within which ISM systems must function in order to be effective. With this vision, leaders throughout the organization can direct efforts to create the necessary environment for effective

ISM implementation and, ultimately, positive culture change that supports safe, environmentally sound and highly productive operations.

f. This attachment seeks to clearly describe and articulate the attributes – expected, observable behaviors and organizational characteristics – typical of the total environment within which ISM must be implemented to be fully effective. Leaders need to implement appropriate change strategies to make these behaviors recognizable and typical in their work environments. In implementing the ISM principles, line managers may want to use the attributes for a given principle as performance indicators to determine how well the principle is being implemented and where additional attention is needed. Achieving these desired work behaviors will result in greater productivity as well as improved safety.

Within the ISM hierarchy, it is the ISM principles that describe the environment or context for work activities, in that most ISM principles apply to each and every ISM function. Experience and research with safety cultures and high-reliability organizations (HRO) over the past ten or more years have raised new insights and deeper understanding relevant to the desired work environment for effective safety management. Experience from the commercial nuclear industry, including the Institute for Nuclear Power Operations (INPO), has been reviewed for relevant lessons. An analysis of this experience and research over the past decade has identified four supplemental safety culture elements that may be helpful to focus attention and action in the right areas to create the desired ISM environments. These elements also promote a shift from compliance toward excellence. They emphasize continuous improvement and long-term performance, and are entirely consistent with the original intents of ISM. These elements are identified and described beginning on page 12 of this attachment.

2. GUIDING PRINCIPLES FOR INTEGRATED SAFETY MANAGEMENT.

The Department has established the following principles to guide implementation of Integrated Safety Management (ISM) systems, as defined in DOE P 450.4, *Safety Management System Policy*.

- **LINE MANAGEMENT RESPONSIBILITY FOR SAFETY**. *Line management is directly responsible for the protection of the public, the workers, and the environment.*

- **CLEAR ROLES AND RESPONSIBILITIES**. *Clear and unambiguous lines of authority and responsibility for ensuring safety shall be established and maintained at all organizational levels within the Department and its contractors.*

- **COMPETENCE COMMENSURATE WITH RESPONSIBILITIES**. *Personnel shall possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.*

- **BALANCED PRIORITIES**. *Resources shall be effectively allocated to address safety, programmatic, and operational considerations. Protecting the public, the workers, and the environment shall be a priority whenever activities are planned and performed.*

- **IDENTIFICATION OF SAFETY STANDARDS AND REQUIREMENTS**. *Before work is performed, the associated hazards shall be evaluated and an agreed-upon set of safety standards and requirements shall be established which, if properly implemented, will provide adequate assurance that the public, the workers, and the environment are protected from adverse consequences.*

- **HAZARD CONTROLS TAILORED TO WORK BEING PERFORMED**. *Administrative and engineering controls to prevent and mitigate hazards shall be tailored to the work being performed and associated hazards.*

- **OPERATIONS AUTHORIZATION**. *The conditions and requirements to be satisfied for operations to be initiated and conducted shall be clearly established and agreed upon.*

Note: The ISM core functions (defined in DOE P 450.4, *Safety Management System Policy*) describe the specific work activities that must be accomplished, and these are not explicitly addressed by this attachment:

(1) "Define the Scope of Work,"

(2) "Analyze the Hazards,"

(3) "Develop and Implement Hazard Controls,"

(4) "Perform Work within Controls," and

(5) "Provide Feedback and Continuous Improvement."

It is vitally important that each organizational element effectively implement these five core functions, beginning with defining its own work, to the extent necessary to support the safe conduct of operational work activities. The core functions are described in detail in DOE G 450.4-1B, *Integrated Safety Management System Guide*, and have received considerable attention. This attachment focuses on the ISM principles because these have received less attention than needed to achieve the requisite environment for effective ISM implementation. The emphasis in this attachment on ISM principles should not be interpreted as a slight in any way on the essential role of the ISM core functions. The current ISM Guide adequately addresses expectations for ISM core functions.

LINE MANAGEMENT RESPONSIBILITY FOR SAFETY

Line management is directly responsible for the protection of the public, the workers, and the environment.

Attributes

- Line managers (from the Secretary to the DOE cognizant Secretarial Officer to the DOE Field Office Manager to the Contractor Senior Manager to the front-line worker) understand and accept their safety responsibilities inherent in mission accomplishment. Line managers do not depend on supporting organizations to build safety into line management work activities.

- Line managers have a clear understanding of their work activities and their performance objectives, and how they will conduct their work activities safely and accomplish their performance objectives.

- Line managers demonstrate their commitment to safety. Top-level line managers are the leading advocates of safety and demonstrate their commitment in both word and action. Line managers periodically take steps to reinforce safety, including personal visits and walkthroughs to verify that their expectations are being met.

- Line managers spend time on the floor. Line managers practice visible leadership in the field by placing "eyes on the problem," coaching, mentoring, and reinforcing standards and positive behaviors. Deviations from expectations are corrected promptly and, when appropriate, analyzed to understand why the behaviors occurred.

- Line managers maintain a strong focus on the safe conduct of work activities. Line managers maintain awareness of key performance indicators related to safe work accomplishment, watch carefully for adverse trends or indications, and take prompt action to understand adverse trends and anomalies.

- Line managers throughout the organization set an example for safety through their direct involvement in continuous learning by themselves and their followers on topics related to technical understanding and safety improvement.

- Line managers are skilled in responding to employee questions in an open, honest manner. They encourage and appreciate the reporting of safety issues and errors. They do not discipline employees for the reporting of errors. They encourage a vigorous questioning attitude toward safety, and constructive dialogues and discussions on safety matters.

- Credibility and trust are present and continuously nurtured. Line managers reinforce perishable values of trust, credibility, and attentiveness. The organization is just – that is, the line managers demonstrate an understanding that humans are fallible and when mistakes are made, the organization seeks first to learn as opposed to blame. The system of rewards and sanctions is aligned with strong safety policies and reinforces the desired behaviors and outcomes.

CLEAR ROLES AND RESPONSIBILITIES

Clear and unambiguous lines of authority and responsibility for ensuring safety shall be established and maintained at all organizational levels within the Department and its contractors.

Attributes

- Responsibility and authority for safety are well defined and clearly understood as an integral part of performing work.
- Organizational safety responsibilities are sufficiently comprehensive to address the work activities and hazards involved.
- The line of authority and responsibility for safety is defined from the Secretary to the individual contributor. Each of these positions has clearly defined roles, responsibilities, and authorities, designated in writing and understood by the incumbent.
- Ownership boundaries and authorities are clearly defined at the institutional, facility, and activity levels, and interface issues are actively managed.
- Organizational functions, responsibilities, and authorities documents are maintained current and accurate.
- Reporting relationships, positional authority, staffing levels and capability, organizational processes and infrastructure, and financial resources are commensurate with and support fulfillment of assigned or delegated safety responsibilities.
- All personnel understand the importance of adherence to standards.
- Line managers provide ongoing reviews of performance of assigned roles and responsibilities to reinforce expectations and ensure that key safety responsibilities and expectations are being met.
- Personnel at all levels of the organization are held accountable for shortfalls in meeting standards and expectations related to fulfilling safety responsibilities. Accountability is demonstrated both by recognition of excellent safety performers as well as identification of less-than-adequate performers. In holding people accountable, in the context of a just culture, managers consider individual intentions and the organizational factors that may have contributed.

COMPETENCE COMMENSURATE WITH RESPONSIBILITIES

Personnel shall possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.

Attributes

- People and their professional capabilities, experiences, and values are regarded as the organization's most valuable assets. Organizational leaders place a high personal priority and time commitment on recruiting, selecting, and retaining an excellent technical staff.

- The organization maintains a highly knowledgeable workforce to support a broad spectrum of operational and technical decisions. Technical and safety expertise is embedded in the organization. Outside expertise is employed when necessary.

- Individuals have in-depth understanding of safety and technical aspects of their jobs. Technical qualification standards are defined and personnel are trained accordingly. Technical support personnel have expert-level technical understanding. Managers have strong technical backgrounds in their area of expertise.

- Assignments of safety responsibilities and delegations of associated authorities are made to individuals with the necessary technical experience and expertise. In rare cases, if this is not possible, corrective and compensatory actions are taken.

- The organization values and practices continuous learning, and requires employees to participate in recurrent and relevant training and encourages educational experiences to improve knowledge, skills, and abilities. Professional and technical growth is formally supported and tracked to build organizational capability.

- Training to broaden individual capabilities and to support organizational learning is available and encouraged – to appreciate the potential for unexpected conditions; to recognize and respond to a variety of problems and anomalies; to understand complex technologies and capabilities to respond to complex events; to develop flexibility at applying existing knowledge and skills in new situations; to improve communications; to learn from significant industry and DOE events.

- Mental models, practices, and procedures are updated and refreshed based on new information and new understanding.

- Training effectively upholds management's standards and expectations. Beyond teaching knowledge and skills, trainers are adept at reinforcing requisite safety values and beliefs.

- Managers set an example for safety through their personal commitment to continuous learning and by their direct involvement in high-quality training that consistently reinforces expected worker behaviors.

- Managers encourage informal opinion leaders in the organization to model safe behavior and influence peers to meet high standards.

BALANCED PRIORITIES

Resources shall be effectively allocated to address safety, programmatic, and operational considerations. Protecting the public, the workers, and the environment shall be a priority whenever activities are planned and performed.

Attributes

- Organization managers frequently and consistently communicate the safety message, both as an integral part of the mission and as a stand-alone theme.
- Managers recognize that aggressive mission and production goals can appear to send mixed signals on the importance of safety. Managers are sensitive to detect and avoid these misunderstandings, or to deal with them effectively if they arise.
- The organization demonstrates a strong sense of mission and operational goals, including a commitment to highly reliable operations, both in production and safety. Safety and productivity are both highly valued.
- Safety and productivity concerns both receive balanced consideration in funding allocations and schedule decisions. Resource allocations are adequate to address safety. If funding is not adequate to ensure safety, operations are discontinued.
- Staffing levels and capabilities are consistent with the expectation of maintaining safe and reliable operations.
- The organizational staffing provides sufficient depth and redundancy to ensure that all important safety functions are adequately performed.
- The organization is able to build and sustain a flexible, robust technical staff and staffing capacity. Pockets of resilience are established through redundant resources so that adequate resources exist to address emergent issues. The organization develops sufficient resources to rapidly cope and respond to unexpected changes.
- Key technical officials are assigned for long terms of service to provide institutional continuity and constancy regarding safety requirements and expectations. Organizational knowledge is valued and efforts are made to preserve it when key players move on.
- Systems of checks and balances are in place and effective at all levels of the organization to make sure that safety considerations are adequately weighed and prioritized.
- Safety and quality assurance positions have adequate organizational influence.
- Adequate resources are allocated for safety upgrades and repairs to aging infrastructure. Modern infrastructure and new facility construction are pursued to improve safety and performance over the long term.

IDENTIFICATION OF SAFETY STANDARDS AND REQUIREMENTS

Before work is performed, the associated hazards shall be evaluated and an agreed-upon set of safety standards and requirements shall be established which, if properly implemented, will provide adequate assurance that the public, the workers, and the environment are protected from adverse consequences.

Attributes

- Facilities are designed, constructed, operated, maintained, and decommissioned using consensus industry codes and standards, where available and applicable, to protect workers, the public, and the environment.

- Applicable requirements from laws, statutes, rules and regulations are identified and captured so that compliance can be planned, expected, demonstrated, and verified.

- Clear, concise technical safety directives are centrally developed, where necessary, and are based on sound engineering judgment and data. DOE directives and technical standards are actively maintained up to date and accurate.

- A clearly-defined set of safety requirements and standards is invoked in management contracts, or similar agreements. An accepted process is used for identification of the appropriate set of requirements and standards. This set of requirements is comprehensive and includes robust quality assurance, safety, and radiological and environmental protection requirements.

- Implementing plans, procedures and protocols are in place to translate requirements into action by the implementing organization.

- Technical and operational safety requirements clearly control the safe operating envelope. The safety envelope is clearly specified and communicated to individuals performing operational tasks.

- Exemptions from applicable technical safety requirements are both rare and specific, provide an equivalent level of safety, have a compelling technical basis, and are approved at an appropriate organizational level.

- Compliance with applicable safety and technical requirements is expected and verified.

- Willful violations of requirements are rare, and personnel and organizations are held strictly accountable in the context of a just culture. Unintended failures to follow requirements are promptly reported, and personnel and organizations are given credit for self-identification and reporting of errors.

- The organization actively seeks continuous improvement to safety standards and requirements through identification and sharing of effective practices, lessons learned, and applicable safety research. The organization is committed to continuously rising standards of excellence.

HAZARD CONTROLS TAILORED TO WORK BEING PERFORMED

Administrative and engineering controls to prevent and mitigate hazards shall be tailored to the work being performed and associated hazards.

Attributes

- Work hazards are identified and controlled to prevent or mitigate accidents, with particular attention to high consequence events with unacceptable consequences. Workers understand hazards and controls before beginning work activities.

- The selection of hazard controls considers the type of hazard, the magnitude of the hazard, the type of work being performed, and the life-cycle of the facility. Controls are designed and implemented commensurate with the inherent level and type of hazard.

- Safety analyses identifying work hazards are comprehensive and based on sound engineering judgment and data.

- Defense in depth is designed into highly-hazardous operations and activities, and includes independent, redundant, and diverse safety systems, which are not overly complex. Defense in depth controls include engineering controls, administrative processes, and personnel staffing and capabilities.

- Emphasis is placed on designing the work and/or controls to reduce or eliminate the hazards and to prevent accidents and unplanned releases and exposures.

- The following hierarchy of defense in depth is recognized and applied: (1) elimination or substitution of the hazards, (2) engineering controls, (3) work practices and administrative controls, and (4) personal protective equipment. Inherently safe designs are preferred over ones requiring engineering controls. Prevention is emphasized in design and operations to minimize the use of, and thereby possible exposure to, toxic or hazardous substances.

- Equipment is consistently maintained so that it meets design requirements.

- Safety margins are rigorously maintained. Design and operating margins are carefully guarded and changed only with great thought and care. Special attention is placed on maintaining defense-in-depth.

- Organizations implement hazard controls in a consistent and reliable manner. Safety is embedded in processes and procedures through a functioning formal integrated safety management system. Facility activities are governed by comprehensive, efficient, high-quality processes and procedures.

- Hazard controls are designed with an understanding of the potential for human error. Error-likely situations are identified, eliminated, or mitigated. Existence of known error-likely situations is communicated to workers prior to commencing work along with planned mechanisms to assure their safety.

OPERATIONS AUTHORIZATION

The conditions and requirements to be satisfied for operations to be initiated and conducted shall be clearly established.

Attributes

- Formal facility authorization agreements are in place and maintained between owner and operator.

- Readiness at the facility level is verified before hazardous operations commence. Pre-operational reviews confirm that controls are in place for known hazards.

- Facility operations personnel maintain awareness of all facility activities to ensure compliance with the established safety envelope.

- Work authorization is defined at the activity level. The work authorization process verifies that adequate preparations have been completed so that work can be performed safely. These preparations include verifying that work methods and requirements are understood; verifying that work conditions will be as expected and not introduce unexpected hazards; and verifying that necessary controls are implemented.

- The extent of documentation and level of authority for work authorization is based on the complexity and hazards associated with the work.

3. SUPPLEMENTAL SAFETY CULTURE ELEMENTS

Based on experience and learning over the past ten years since the inception of Integrated Safety Management, the Department has identified the following four supplemental safety culture elements to be used, along with the existing ISM guiding principles, to help develop the appropriate context or environment for effective implementation of Integrated Safety Management (ISM) systems within the Department of Energy and at its sites and facilities in the future:

- **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.*

- **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, conservative decision-making, open communications, deference to expertise, and systematic approaches to eliminate or mitigate error-likely situations.*

- **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.*

- **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 continuous learning environment.*

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.

Attributes:

- Individuals understand and demonstrate responsibility for safety. Safety and its ownership are apparent in everyone's actions and deeds. Workers are actively involved in identification, planning, and improvement of work and work practices. Workers follow approved procedures. Workers at any level can stop unsafe work or work during unexpected conditions.

- Individuals promptly report errors and incidents. They feel safe from reprisal in reporting errors and incidents; they offer suggestions for improvements**.**

- Individuals are mindful of the potential impact of equipment and process failures; they are sensitive to the potential of faulty assumptions and errors, and demonstrate constructive skepticism. They appreciate that mindfulness requires effort.

- Individuals recognize that errors and imperfections are likely to happen. They recognize the limits of foresight and anticipation, and watch for things that have not been seen before. They appreciate that error-likely situations are predictable, manageable, and preventable, and seek to identify and eliminate latent conditions that give rise to human performance errors.

- Individuals cultivate a constructive, questioning attitude and healthy skepticism when it comes to safety. Individuals question deviations, and avoid complacency or arrogance based on past successes. Team members support one another through both awareness of each other's actions and constructive feedback when necessary.

- Individuals are aware of and counteract human tendencies to simplify assumptions, expectations, and analysis. Diversity of thought and opposing views are welcomed and considered. Intellectual curiosity is encouraged.

- Individuals are intolerant of conditions or behaviors that have the potential to reduce operating or design margins. Anomalies are thoroughly investigated, promptly mitigated, and periodically analyzed in the aggregate. The bias is set on proving work activities are safe before proceeding, rather than proving them unsafe before halting. Personnel do not proceed and do not allow others to proceed when safety is uncertain.

- Individuals outside of the organization (including subcontractors, temporary employees, visiting researchers, vendor representatives, etc.) understand their safety responsibilities.

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, conservative decision-making, open communications, deference to expertise, and systematic approaches to eliminate or mitigate error-likely situations.

Attributes

- Line managers are 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.

- Operational anomalies, even small ones, get prompt attention and evaluation – this allows early detection of problems so necessary action is taken before problems grow.

- Individuals are systematic and rigorous in making informed decisions that support safe, reliable operations. Workers are expected and authorized to take conservative actions when faced with unexpected or uncertain conditions. Line managers support and reinforce conservative decisions based on available information and risks.

- Candid dialogue and debate and a healthy skepticism are encouraged when safety issues are being evaluated. Differing professional opinions are welcomed and respected. Robust discussion and constructive conflict are recognized as a natural result of diversity of expertise and experience.

- Line managers regularly and promptly communicate important operational decisions, their basis, expected outcomes, potential problems, and planned contingencies.

- Organizations know the expertise of their personnel. Line managers defer to qualified individuals with relevant expertise during operational upset conditions. Qualified and capable people closest to the operational upset are empowered to make important decisions, and are held accountable justly.

- Operations personnel are held to high standards of both technical understanding and detailed task-oriented performance. Operations personnel provide reliable and consistent responses to expected occurrences. Flexible responses to unexpected occurrences are based on continuous preparation and training. Formality and discipline in operations is valued.

- Organizational systems and processes are designed to provide layers of defenses, recognizing that people are fallible. Prevention and mitigation measures are used to preclude errors from occurring or propagating. Error-likely situations are sought out and corrected, and recurrent errors are carefully examined as indicators of latent organizational weaknesses. Managers aggressively correct latent organizational weaknesses and measure the effectiveness of actions taken to close the gaps.

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.

Attributes:

- Performance assurance consists of robust, frequent, and independent oversight, conducted at all levels of the organization. Performance assurance includes independent evaluation of performance indicators and trend analysis.

- Performance assurance programs are guided by plans that ensure a base level of relevant areas are reviewed. Assessments are performed against established requirements (such as those defined in Criteria and Review Approach Documents).

- Efficient redundancy in monitoring is valued; higher levels of redundancy are recognized as necessary for higher risk activities.

- Performance Assurance includes a diversity of independent "fresh looks" to ensure completeness and to avoid complacency. A mix of internal and external oversight reviews reflects an integrated and balanced approach. This balance is periodically reviewed and adjusted as needed.

- The insights and fresh perspectives provided by performance assurance personnel are valued. Organizational feedback is actively sought to make performance assurance activities more value-added.

- Complete, accurate, and forthright information is provided to performance assurance organizations.

- Results from performance assurance activities are effectively integrated into the performance improvement processes, such that they receive adequate and timely attention. Linkages with other performance monitoring inputs are examined, high-quality causal analyses are conducted, as needed, and corrective actions are tracked to closure with effectiveness verified to prevent future occurrences.

- Line managers throughout the organization set an example for safety through their direct involvement in oversight activities and associated performance improvement.

- Senior line managers are periodically briefed on results of oversight group activities to gain insight into organizational performance and to direct needed corrective actions.

- Periodic ISM reviews, assessments, and verifications are conducted and used as a basis for ISM program adjustments and implementation improvements.

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 continuous learning environment.

Attributes:

- The organization actively and systematically monitors performance through multiple means, including leader walk-arounds, 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.

- Processes are established to identify and resolve latent organizational weaknesses that can aggravate relatively minor events if not corrected. Linkages among problems and organizational issues are examined and communicated.

- Open communications and teamwork are the norm. People are comfortable raising and discussing questions or concerns. Good news and bad news are both valued and shared.

- A high level of trust is established in the organization. Reporting of individual errors is encouraged and valued. A variety of methods are available for personnel to raise safety issues, without fear of retribution.

- Organization members convene to swiftly uncover lessons and learn from mistakes. Frequent incident reviews are conducted promptly after an incident to ensure data quality to identify improvement opportunities.

- Operating experience is highly valued, and the capacity to learn from experience is well developed. The organization regularly examines and learns from operating experiences, both internal and in related industries.

- Expertise in causal analysis is applied effectively to examine events and improve safe work performance. High-quality causal analysis is the norm. Causal analysis is performed on a graded approach for major and minor incidents, and near-misses, to identify causes and follow-up actions. Even small failures are viewed as windows into the system that can spur learning.

- Performance improvement processes encourage workers to offer innovative ideas to improve performance and to solve problems.

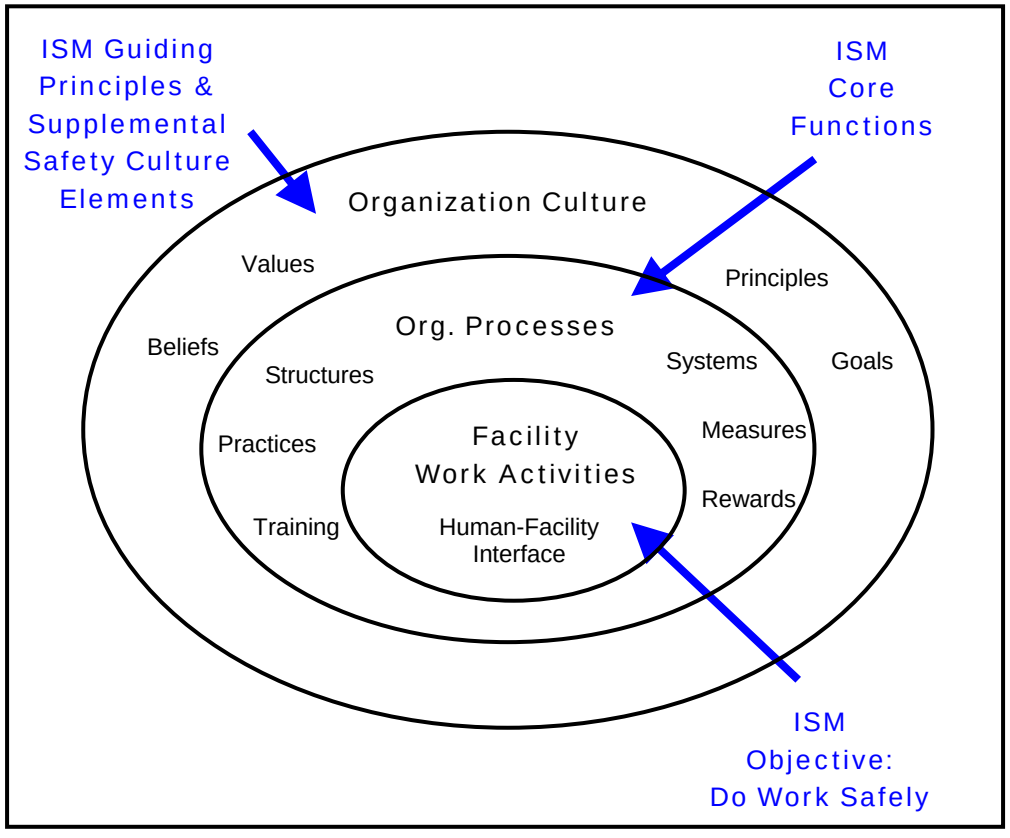
- Line managers are actively involved in all phases of performance monitoring, problem analysis, solution planning, and solution implementation to resolve safety issues.

- Vigorous corrective and improvement action programs are in place and effective. Rapid response to problems and closeout of issues ensures that small issues do not become large ones. Managers are actively involved to balance priorities to achieve timely resolutions.

4. RELATIONSHIP BETWEEN ISM PRINCIPLES, FUNCTIONS, OPERATIONAL WORK, AND PERFORMANCE RESULTS.

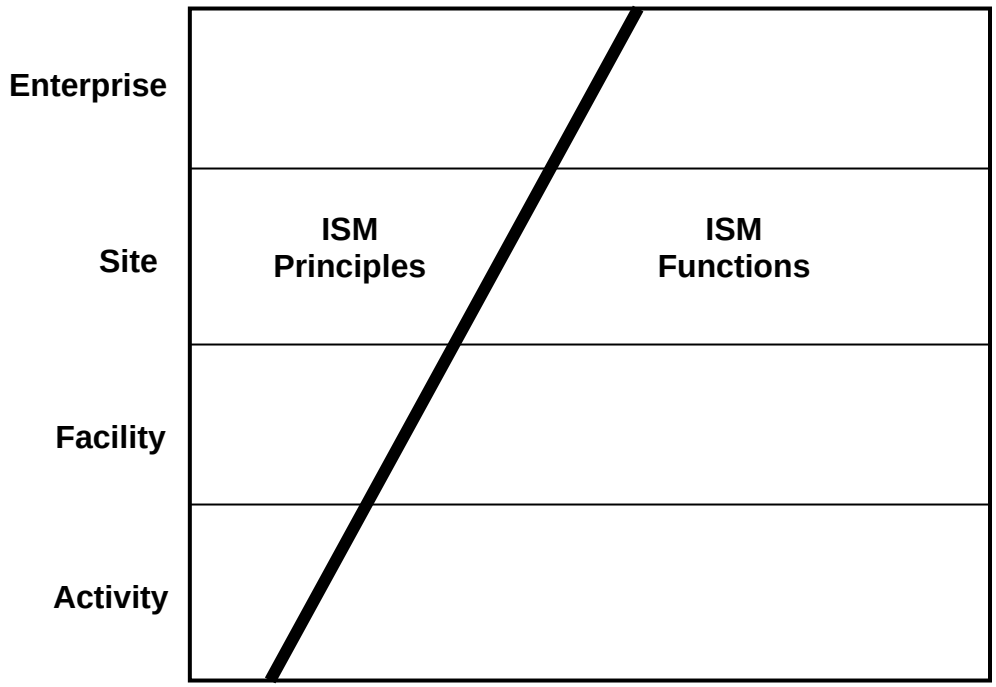
The figure below depicts various levels within the organizational culture. The outer level represents the environment within which the work must take place. The outer level is most influenced by the ISM Principles (and the supplemental safety culture elements). The next level is the process level, where management systems are defined to direct behaviors. This level is most influenced by the ISM Functions. The inner-most level is the activity-level work itself, where operational work is performed. This work is the direct interaction between people and physical facility, and is mostly performed by DOE contractors (except at GoGos). This is the level at which organizations can measure ultimate performance results and determine whether the ISM program objectives have been realized. Performance measures at other levels can show how effectively the process and culture support the desired safety objectives. Showing work at the inner-most level does not mean that work is not required at the other levels; indeed, work activities are required at the other levels to develop work processes and highly reliable, error tolerant work environments.

Organizations are systems and it is important that the organization be measured at all three levels, with their alignment routinely assessed. Understanding the performance and perceptions at each level is essential to the development of integrated organizational, process, and work activity improvements that are likely to be effective and sustaining.



5. RELATIVE FOCUS OF ATTENTION BY LEVEL.

Different levels of the organization (enterprise, site, facility, and activity) will provide different levels of attention to implementing the ISM principles and ISM functions. As the ISM principles relate more to establishing the desired environment and the desired culture, more attention to implementing the ISM principles is expected at higher levels of the organization (such as the enterprise and site level). At the lower levels, attention to the ISM principles will not need to be as focused, since many of the principles should be effectively built into work procedures and practices. Regarding ISM functions, this is the primary focus of the lower levels of the organization and will require the clear majority of its relative attention. For the higher levels of the organization, their involvement and attention will also be needed to facilitate accomplishment of the ISM functions, although in a lower percentage when compared to attention to ISM principles. The figure below illustrates this concept.



Relative Focus of Attention by Level

6. IMPLEMENTATION.

a. Initially, DOE offices will be required by this Manual to prepare ISM system descriptions that address how the existing ISM principles will be implemented to create the desired behaviors for effective ISM implementation. DOE offices may also choose to use the supplemental safety culture elements and/or associated attributes to help them in developing their ISM system descriptions. Attempts to incorporate these elements in the DOE office ISM systems descriptions should not delay or detract from establishing the basic ISM framework described in DOE P 450.4, *Safety Management System Policy*. DOE contractors are not required to make any changes to their ISM Systems to address the supplemental safety culture elements.

b. In 2007, the DOE and contractor community will engage in a dialogue about the ultimate role of the concepts in this Attachment. Based on the outcomes of that dialogue, the DOE ISM directives will be revised to capture the experience, lessons learned, successful implementation methods, and good practices related to implementation. At that time, it is expected that the seven ISM guiding principles and the four supplemental safety culture elements will be reviewed for possible integration into a single set. This process may include combining some of these items where appropriate. This process may also determine that some or all of the attributes of the four supplemental safety culture elements described in this Attachment can be adequately assigned to existing ISM principles and functions. Only after the associated DOE directives and ISM DEAR clause are revised will the contractors be required to address any potential changes or additions to the ISM program related to this Attachment.

7. ASSESSMENTS.

The material in this Attachment is provided to clarify expectations for implementation of the ISM guiding principles and to describe supplemental safety culture elements. The attributes are not intended for use as assessment criteria. The attributes are intended for use as a management tool to help clarify expectations of organizations and employees. The attributes may be used as performance indicators regarding how well an organization is implementing the ISM principles or supplementary safety culture elements. When used as performance indicators, reviews against the attributes should be used for diagnosis and improvement. In general, an organization's safety management system, as documented in its ISM system description, is the authoritative document against which implementation should be assessed.

8. CONCLUSION

Thorough and consistent implementation of the principles in this document will provide the necessary environment for DOE organizations to succeed and thrive. This Attachment provides the vision for DOE to achieve the essential attributes of a high-performing organization, and further improve the Department's safety record and productivity record. This vision captures the elements needed for DOE to move beyond a compliance-based approach to a performance-based approach, consistent with more mature high-reliability organizations.

For example, the International Atomic Energy Agency (IAEA) developed a capability maturity model that illustrates the stages that an organization goes though in achieving a mature safety culture. These stages are:

Stage I. The organization sees safety as an external requirement and not as an aspect of conduct that will help the organization to succeed. The external requirements are those of national governments, regional authorities, or regulatory bodies. There is little awareness of behavioral and attitudinal aspects of safety performance, and no willingness to consider such issues. Safety is seen very much as a technical issue. Mere compliance with rules and regulations is considered adequate.

Stage II. An organization at Stage II has a management which perceives safety performance as important even in the absence of regulatory pressure. Although there is growing awareness of behavioral issues, this aspect is largely missing from safety management methods which comprise technical and procedural solutions. Safety performance is dealt with, along with other aspects of the business, in terms of targets or goals. The organization begins to look at the reasons why safety performance reaches a plateau and is willing to seek the advice of other organizations.

Stage III. An organization at Stage III has adopted the idea of continuous improvement and applied the concept to safety performance. There is a strong emphasis on communications, training, management style, and improving efficiency and effectiveness. Everyone in the organization can contribute. Some behaviors are seen within the organization which enables improvements to take place and, on the other hand, there are behaviors which act as a barrier to further improvement. Consequently, people also understand the impact of behavioral issues on safety. The level of awareness of behavioral and attitudinal issues is high, and measures are being taken to improve behavior. Progress is made one step at a time and never stops. The organization asks how it might help other companies.

The environment described herein can take the Department to IAEA Stage III performance, a fully developed safety culture. On the path to achieving a fully developed safety culture, the culture in various parts of an organization is likely to be at different stages of development. As such, until the fully mature culture is achieved, organizations will likely be able to recognize the characteristics of more than one stage at any given time.

GUIDELINES FOR DEVELOPING DOE ISM SYSTEM DESCRIPTIONS

1. INTRODUCTION AND GENERAL APPROACH TO CHANGE.

The Department views the ISM system description as the primary, all-encompassing road-map for accomplishing work in a safe and environmentally sound manner within the organization. The system description defines the integral role of safety in the Department's business approach, processes, and financial management control system. [Note: In ISM, the term "safety" is used synonymously with environment, safety, and health (ES&H) to encompass protection of the public, the workers, and the environment.]

The objective of developing and maintaining ISM system descriptions is much more than a simple paper or documentation exercise, where DOE organizations identify activities and processes being accomplished to fulfill ISM principles and functions. Rather, it is expected to spur real and ongoing dialogue and exploration of areas needing attention for ISM implementation and improvement. Senior leadership commitment to ISM must be visible and clear at all levels (that is, the DOE enterprise level, the DOE Secretarial office level, the DOE field office level, and the contractor level). This commitment is borne out of an understanding of intended safety management values and processes, and personal engagement in developing and sustaining the ISM system. The ISM system is documented for stability and continuity, for communicating to existing organization members and others the office's approach to safety management, and for new members to be inculcated. Organizations that question the value of developing and maintaining their ISM system descriptions are likely not approaching the activity with the proper attitude and desired commitment to real continuous improvement.

Development of ISM systems and implementation of identified improvements and commitments is expected to have a significant impact on DOE attitudes and behaviors related to safety. As such, these desired changes should be managed consciously and vigorously. The following change management steps (see John P. Kotter, 1996, Leading Change, Boston: Harvard Business School Press) are valid and relevant to this effort, both in development and in implementation of ISM systems:

- Develop a Sense of Urgency
- Establish the Guiding Coalition
- Develop the Vision and Strategy
- Communicate the Change Vision
- Empower Employees for Broad-Based Action
- Generate Short-Term Wins
- Consolidate Gains and Produce More Change

- Anchor New Approaches in the Culture (Institutionalize the New Approaches)

2. DEVELOPING THE ISM SYSTEM DESCRIPTION. The format of the ISM system description is left up to the developing organizations, but the documents must address the elements defined in Section II, Requirements, of this Manual. The following approach is recommended:

   a. Develop a full understanding of the ISM system:

      - Review ISM objective, principles, functions and associated DOE directives and guidance.

      - Develop DOE office leadership goals, emphasis areas and top-level commitments, if desired.

      - Determine outcomes and results to be achieved through ISM.

      - Establish key roles and responsibilities for implementation.

   b. Define the DOE management processes and systems that will be used to achieve the ISM Principles and Functions. For example, the office may use its Functions, Responsibilities and Authorities Manual as the implementing mechanism for Guiding Principle #2, Clear Roles and Responsibilities. Describe the management systems needed to execute each ISM Principle (including the four supplemental safety culture elements, if desired) and each ISM Function:

      - Describe the federal work activities relevant to each ISM principle and function to ensure that it is effectively executed.

      - Define the management systems and processes needed for each Principle and Function. Management systems are the primary implementing mechanisms for ensuring implementation of ISM.

      - Align the management systems to each ISM Principle and Function, and with each other.

      - Integrate ISM with other management systems, such as Quality Assurance Programs, Environment Management Systems, and Integrated Safeguards and Security management systems. Describe linkages, interfaces, and coordinating mechanisms.

      - Examine the condition of the management systems (gap analysis) to determine if they effectively execute ISM Principles. Identify gaps. Identify strengths and weaknesses.

      - Identify the management systems that need to be established or strengthened. Identify specific actions (with end-state deliverables, responsible managers,

and completion schedules) to establish and improve needed management processes and systems.

- Describe the communications and training plan that ensures that all members of your organization will be familiar with the organization's ISM system and will be familiar with their safety roles and responsibilities.

- Identify those outside your organization that contribute work activities to fulfilling your organization's ISM responsibilities. Establish mechanisms to ensure those identified are familiar with your ISM system and perform their work activities consistent with your ISM system. Identify and control the interfaces between organizations.

c. Identify other DOE actions/initiatives taken to improve safety (supplemental to the management systems) and promote a positive safety culture. These can most likely be associated with implementation of specific ISM functions and principles. Examples of other DOE initiatives:

- Monthly all-hands meetings with a safety focus.

- Developing a safety brochure explaining the Manager's safety values.

- Establishing DOE teams to develop improvement initiatives.

- Safety objectives and measures developed in support of DOE P 450.7 *Environment, Safety and Health (ES&H) Goals*, dated 8-2-04.

d. Define the expected attributes and results of the ISM system. Describe how ISM system effectiveness will be demonstrated. Describe how continuous improvement will be demonstrated. Determine how your organization will measure progress (performance measures):

- Quantify specific DOE safety objectives for tracking.

- Consider measures for each individual ISM Principle and Function.

- Relate the measures directly to DOE work activities

e. Determine how you will maintain and improve your ISM system:

- ISM System Description changes

- ISM System Effectiveness reviews

- ISM Annual Declarations

- ISM Safety Performance Objectives, Measures, and Commitments Updates

- ISM Summary Evaluations

f. Confirm that implementation mechanisms (processes, policies, protocols, procedures, training, etc.) are adequate to implement and integrate the ISM objective, principles, and functions. Prepare cross-walk to communicate implementation mechanisms and demonstrate coverage of ISM objective, principles, and functions.

g. Describe how the Principles, Management Systems, other Implementing Mechanisms, and Performance Measures integrate to achieve ISM attributes and objectives.

h. Prepare summary of actions to implement the ISM system description and/or its update, and to address known weaknesses and opportunities for improvement. For example, identify schedule and responsibility for revision to the office Functions, Responsibilities and Authorities Manual, if necessary. This summary of actions should address necessary resources and staffing.

3. SAMPLE TABLE OF CONTENTS FOR ISM SYSTEM DESCRIPTION. The following is a sample Table of Contents.

Executive Summary

Definitions and Acronyms

1.0 Purpose and Objectives

2.0 Overview of the ISM System

3.0 Management Expectations

4.0 Roles and Responsibilities

4.1 Federal Responsibilities

4.2 Contractor Expectations

5.0 Implementation of ISM

5.1 Implementation of ISM Guiding Principles (including four supplemental safety culture elements)

5.2 Implementation of the Five Core Functions

5.3 Integration with QA, EMS, and ISSM

5.4 Communications and Training Plan

6.0 Other Safety-Related Initiatives

7.0 Annual ISM Maintenance and Continuous Improvement Processes

7.1 ISM System Description Maintenance and Continuous Improvement

7.2 ISM Annual Oversight, Self-Assessments, Annual Effectiveness Reviews, and Annual Declarations

7.3 ISM Annual Safety Performance Objectives, Measures and Commitments Process

7.4 ISM Annual Effectiveness Review and Declaration Process

8.0 Conclusions

Attachment 1: Cross-Walk to Implementing Mechanisms

Attachment 2: Annual Update to Safety Performance Objectives, Measures, and Commitments

Attachment 3: Summary of Implementation Actions

4. INTEGRATION OF MANAGEMENT SYSTEMS. The Department has established requirements for multiple management systems, including:

- Integrated Safety Management System
- Environmental Management System
- Quality Assurance, including Oversight Programs and Assurance Systems (as required by DOE O 226.1, *Implementation of Department of Energy Oversight Policy*)
- Worker Safety and Health Program (as required by 10 CFR 851, *Worker Safety and Health Program*)
- Emergency Management System
- Project Management System
- Financial Management System
- Integrated Safeguards and Security Management System

The Environmental Management System is expected to be part of the ISM system. The Quality Assurance program is to be integrated with the ISM system. It is desirable that these three programs in particular be well integrated, under an ISM umbrella. Secretarial

offices should provide further direction and guidance to field offices on how to integrate management systems effectively.

Line oversight programs should also be integrated into ISM system descriptions. DOE O 226.1 calls for development of line oversight program description documents in a number of topic areas, including safety, quality assurance, and security. Clearly, the safety oversight program must be integrated with the ISM program. In many cases, the ongoing line management oversight reviews will meet requirements for ISM self-assessments and ISM oversight reviews. A well-crafted line oversight review program will feed naturally into the annual ISM effectiveness review, so that the ISM effectiveness review merely rolls up the results of a number of other reviews that were conducted during the year. Line programs will need to consider which option is most effective for its use: (1) packaging all line oversight programs into one document, (2) packaging the safety oversight program with the ISM system description, (3) having multiple stand-alone documents that are appropriately integrated and cross-referenced, or (4) some combination of the above.

Contractors are required to establish Worker Health and Safety Programs pursuant to 10 CFR 851, *Worker Safety and Health Program.* Contractors may use their ISM system descriptions as the required description of their worker safety and health program; provided that they provide a basis that identifies specific portions of the ISM system description that satisfy the 10 CFR 851 requirements and obtain approval of the DOE field element (see Federal Register, Vol. 71, No. 27, page 6880, February 9, 2006). DOE offices should encourage integration of contractor worker health and safety programs into ISM system descriptions.

These multiple systems should be coordinated, linked, and integrated to the maximum extent possible. If one integrated system description can be achieved, which effectively communicates to its multiple intended audiences, this is desirable. If one integrated system description can not be achieved, then, at the least, the interfaces of the various systems need to be identified, acknowledged and articulated. The feasibility of successfully integrating these various systems into one Manual has not been fully determined. It is important that the main purpose and functions of each system are not lost or subsumed.

The Department expects that experience over the next few years in integrating management systems will provide best practices that can then be shared with others and further reflected in Department guidance and direction.

5. SAMPLE DOE WORK ACTIVITIES.

The Department's role is different from the contractor role, but it is important for assuring safety, and it needs to be clearly articulated in the ISM system description. DOE has work activities related to every ISM principle and function.

DOE federal organizations (except for GO-GO facilities) do not perform "operational work activities" involving physical, hands-on work, such as turning knobs in a production

line or a control room, processing or transferring environmental waste, performing maintenance on a pump or valve, or disassembling weapons or re-packaging pits. "Operational work activities" are the focus of ISM in that physical work activities are the main source of active human errors that can lead to facility occurrences and organizational accidents. Some occurrences are initiated by equipment failures, such as tank failures; in these cases, an "operational work activity" usually exists to monitor performance of equipment that controls hazards. "Operational work activities" are concentrated within the ISM core function #4, "perform work safely within controls." They are also concentrated at the activity-level, rather than the organizational- or enterprise-level.

DOE and contractors perform myriad non-operational work activities that are essential for assuring safety during the conduct of "operational work activities." These non-operational work activities include defining work scopes, allocating resources, designing safety controls, developing safety analyses, conducting assessments, developing corrective action plans, and integrating feedback sources to identify opportunities for improvement. Non-operational work occurs away from the human-facility interface. Non-operational work activities encompass the vast majority of DOE and contractor work related to effectively implementing the ISM principles to create the requisite environment and culture that supports effective ISM implementation. Non-operational work activities encompass most of DOE and contractor work related to effectively implementing four of the five core ISM functions, all but the fourth one, which is the point at which people directly and physically interact with the facility. Non-operational work activities encompass the vast majority of DOE and contractor work at the organizational- and enterprise-level. Non-operational work activities are the source of latent conditions that enable active errors during operational work activities that can lead to undesirable consequences. When planning, performing, and reviewing the effectiveness of non-operational work activities, the ultimate result is the impact of these work activities on safety performance of associated operational work activities. The associated operational work activities should remain the focus of non-operational work activities, not the physical work involved in the non-operational work activities, such as turning on the computer, performing a calculation, participating in a meeting, or printing a document.

Examples of inherently Federal non-operational work activities that are required for the overall Department-wide ISM system to be effective, and to integrate safety effectively into operational work being accomplishment in the Department's facilities, include:

- Providing clear and visible DOE leadership vision on ISM system;
- Establishing a positive DOE environment for effective ISM system implementation;
- Establishing missions;
- Translating the missions into meaningful scopes of work;
- Establishing annual budgets, including making decisions on mission-safety trade-offs;

- Prioritizing major projects and work-scopes, and allocating resources to ensure that work and safety are integrated and sufficient resources are available to conduct work safely;
- Evaluating resource short-falls and identifying safety problems to ensure adequate resources are applied to resolve safety problems and secure safety improvements;
- Developing DOE safety rules, directives and standards;
- Establishing DOE contracts, including delineation of safety requirements;
- Approving exemptions to safety requirements;
- Assigning DOE safety management roles and responsibilities;
- Recruiting highly qualified, technical Federal personnel;
- Reviewing and approving contractor safety documentation, such as documented safety analyses, technical safety requirements, ISM Systems, Quality Assurance Programs, worker safety and health programs, and contractor assurance systems;
- Determining when authorization agreements are needed and approving authorization agreements;
- Maintaining Federal awareness of contractor work activities, including implementation of hazard controls;
- Performing operational readiness reviews;
- Maintaining operational awareness;
- Establishing and implementing feedback and improvements programs and processes to facilitate a culture that promotes ongoing examination and learning;
- Monitoring various sources of feedback information;
- Developing, and implementing corrective actions and improvement actions;
- Monitoring performance of corrective action and improvement action sub-systems;
- Managing the DOE operational experience program;
- Planning and performing self-assessments of assigned federal work activities;
- Planning and performing oversight of contractor work activities;

- Providing clear expectations for the conduct of DOE line management oversight reviews and self-assessment activities, including direction on criteria and review approach documents (CRADs) to use;

- Planning and performing DOE line management oversight of DOE activities, as appropriate;

- Performing independent oversight of DOE and contractor activities;

- Identifying and acting on ISM weaknesses and opportunities for improvement;

- Reviewing annual ISM declarations by contractors;

- Performing annual ISM effectiveness reviews;

- Providing direction, establishing schedules, and approving annual performance objectives, performance measures, and commitments for contractors;

- Integrating management systems and process for safety, quality, environmental protection, and security; and

- Determining when full ISM verification reviews are necessary.

Safety improvement comes when each of these functions is performed in an integrated, effective manner. Therefore, the ISM system descriptions serve to facilitate and focus thinking and planning of an appropriate approach to safety management, and organizing and implementing the necessary follow-through activities. These descriptions are also expected to capture and institutionalize future changes and improvements to the approach during annual updates thus providing new organization members with a road-map to see the full-integrated vision.

ISM is applicable to all facility life-cycle phases including design, construction, operation, and decontamination and decommissioning. DOE is in the unique position of being involved with projects in all phases, whereas contractors often change, both from phase-to-phase, and within a given phase, over time. Thus, DOE work activities need to provide the continuity throughout the life-cycles, making sure that requirements are met and necessary information is available for future phases.

6. RELATIONSHIP OF MAJOR IMPROVEMENT INITIATIVES TO ISM.

The Department adopts and encourages DOE Secretarial offices, field offices, and contractors to implement the principles and functions of a variety of processes and initiatives aimed at improving organizational and individual performance. Many tools and mechanisms are available and most have been or are being used in one form or another in DOE and contractor organizations. A non-inclusive list of performance improvement programs or processes follow:

- Human Performance Improvement (HPI)
- Voluntary Protection Program (VPP)
- Behavior Based Safety (BBS)
- Enhanced Work Planning (EWP)
- Safety Conscious Work Environment (SCWE)
- Chemical Process Safety Management Systems
- Conduct of Operations (COO)
- Conservative decision making
- NRC Risk-informed inspection and decision making
- ASME Standard NQA-1, QA Requirements for Nuclear Facility Applications
- ISO Standard 9001, Quality Management System
- Total Quality Management
- Six Sigma Quality Programs
- ISO Standard 14001, Environmental Management System

All of these tools, processes or approaches can be adapted to complement ISM. They share many common principles that affect organizational and individual worker, supervisor and management behavior and performance.

In using these tools, processes, and approaches, it is important to implement them within an ISM framework, not as stand-alone programs outside of the ISM framework. These tools cannot compete with ISM, but must support ISM. To the extent that these tools help to clarify and improve implementation of the ISM system, the use of these tools is strongly encouraged. The relationship between these tools and the ISM principles and functions needs to be clearly understood and articulated in ISM system descriptions if these tools impact on ISM implementation. It is also critical that the vocabulary and terminology used to apply these tools be aligned with that of ISM. Learning organizations borrow best practices whenever possible, but they must be translated into terms that are consistent and in alignment with existing frameworks.

7. SAFETY PERFORMANCE OBJECTIVES, MEASURES, AND COMMITMENTS.

The purpose of safety performance objectives, measures, and commitments is to drive improvement in safety performance and ISM system effectiveness.

Performance objectives can be long-term management system goals or specific management objectives or deficiencies that need to be addressed. They may be driven by strategic planning processes or safety goals processes (via DOE P 450.7). Performance objectives are expected to remain relatively unchanged over multiple years, with a bias toward continuously rising standards of performance. Improving performance is expected over the long term.

Performance commitments are specific actions that will be taken during a specific year to further achievement of long-term performance objectives. Commitments are steps that will be funded to move toward accomplishment of the performance objectives. Performance commitments would be expected to address significant identified weaknesses or areas of improvement. These may include either major corrective actions or major improvement actions.

Performance measures are used to track progress and monitor achievement of performance objectives and commitments. The most useful performance measures provide information that directly reflects how safely the operational work is being performed. A combination of leading (process or behavioral) and lagging (outcome or results) indicators is desirable. The measures are changed as necessary to address the performance objectives, and significant identified weaknesses and areas for improvement. Annual performance expectations should be established for most of these measures.

Performance objectives, measures, and commitments are developed based upon numerous considerations including the budget process. This approach to continuous improvement recognizes the need for investment in improvement. The ISM guiding principle, "Balanced Priorities," must be considered in developing appropriate performance objectives, measures, and commitments.

Secretarial office ISM system descriptions should describe how ISM performance is measured and may provide a standard set of ISM performance indicators. This should be included in the section on ISM system performance objectives, measures, and commitments, and should be updated annually.

The following are sample topic areas for consideration as DOE performance objectives, measures, and commitments if problems exist or if emphasis needs to be placed; this list should not be considered all-inclusive or mandatory:

- ISM System Effectiveness
- Management Systems
- Regulatory Performance
- Quality Assurance
- Safety Culture

- Authorization Bases
- Stakeholder Relations
- Operational Performance
- Environmental Protection
- Waste Management
- Emergency Preparedness
- Safeguards and Security
- Fire Protection
- Transportation Management
- Near-Misses
- Work Planning and Control
- Feedback and Improvement
- Effectiveness Reviews of Completed Corrective Actions
- Safety Issue Reporting
- Management Walk-Through Program
- Assessment and Oversight Program
- Self-Assessment
- Vital Safety System Assessments
- Clear Roles and Responsibilities
- Human Resource Management
- Employee Training and Development
- Minority/Differing Professional Opinion
- Subcontractor Safety Performance
- Electrical Safety

- Criticality Safety
- Nuclear Safety Basis Document Updates
- Project Controls and Baseline Management
- Project Management
- Workforce Management
- Occupational Safety and Health (Industrial Safety and Health)
- Radiological Safety
- Infrastructure and Facility Management
- Systems and Equipment Essential to Safety
- Construction Management
- Decontamination and Decommissioning
- Maintenance
- Configuration Management
- Environmental Restoration
- Risk Reduction
- Pollution Prevention/ Sustainable Environmental Stewardship
- National ambient air quality standards attainment
- Watershed approach for surface water protection
- Site-wide approach for ground water protection
- Protection of natural resources
- Protection of cultural resources.

The following are sample performance objectives:

- Achieve zero organizational accidents.
- Perform work so that personnel hazards are anticipated, identified, evaluated, and controlled.

- Perform work in a manner that does not present a threat of harm to the public or the environment and will identify, control, and respond to environmental hazards.
- Be recognized for operational excellence.
- Be recognized for excellent personnel.
- Be recognized for excellent safety culture.
- Be recognized for sound environmental management practices.
- Senior leadership commitment to safety is clear and visible.
- Establish and sustain a robust safety culture, consistent with ISM principles.
- Fully integrate human performance improvement initiatives into ISM systems
- Demonstrate sound stewardship of the site through safe and effective hazardous and radioactive waste minimization and management through restoration of the site where degradation has occurred.

The following are sample performance measures:

- Exposures of personnel to chemical, physical, and biological hazards are adequately controlled.
- Accident and injury rates, lost workday case rates, and the DOE injury cost index are adequately controlled. Perform better than comparable industry statistics and exhibit a downward trend.
- Exposures of personnel to ionizing radiation are adequately controlled. ORPS-reportable occurrences, intakes of radioactivity, and skin contaminations are managed and minimized.
- Radioactive material is adequately controlled.
- The Fire Department response time and the rate of completion of required fire protection is adequately controlled and accomplished.
- Environmental violations and releases are adequately controlled.
- Reduce the amount of waste generated and the amount of pollutants emitted.
- Manage hazardous and radioactive wastes in a manner that meets regulatory requirements and is cost effective.
- Identify and control (n) number of error likely situations.

- Behavioral and process measures – such as the number of near-misses, the number of error reports, the number of behavioral observations, the number of safe acts, etc.
- Events - First Aid Cases, Occurrences, Near Misses.
- Safety Inspections - Number and Score.
- Employee Input – Safety Concerns and Survey Responses.
- Management Assessment Results.
- Housekeeping Inspection Results.
- Safety Related Work Package Cycle Time.
- Procedure Compliance rates.
- Corrective actions are timely.
- Corrective actions are effective at resolving originally-identified causes.
- The number of repeat occurrences is minimized through effective corrective actions.
- Employee concerns are tracked and resolved in a timely manner.
- Employee concerns are effectively addressed to resolve the identified concerns.
- Self-assessments effectively identify issues raised by independent organizations when systemic issues are identified.
- The quality of safety basis documents, as measured by defects identified by assessments or occurrences, is excellent.
- Issue Assessment and Oversight Schedule by September 30th.
- Complete 95% or greater of annually planned assessments.
- Complete 90% or greater of identified employee qualifications on time.
- Implement line manager walk-around program such that line managers spend at least 100 hours individually in the field each year.
- Define work scope priorities and communicate them to contractors by July 31st of each year to guide annual work planning.
- Review corrective actions monthly with the contractor for any cost or schedule variance that is greater than a negative 10%.

- Conduct monthly all-employees meeting with an emphasis on safety.
- Implement Differing Professional Opinion procedure and train employees.
- Environmental compliance performance improvement and pollution prevention performance improvement.

The following are sample performance commitments:

- Develop Performance Evaluation standards to ensure greater line management responsibility and accountability for safety.
- Develop and implement processes for work planning and control that fulfill the attributes of best practice processes.
- Develop a robust and comprehensive line organization self-assessment program to assess overall safety performance and ISM effectiveness.
- Achieve pollution prevention and sustainable environmental stewardship goals set forth in DOE O 450.1.
- Implement DOE ISM supplemental safety culture elements.
- Initiate two HPI projects.
- Achieve pollution prevention and sustainable environmental stewardship goals set forth in DOE O 450.1.
- Train employees on ISM system revisions.
- Conduct 2 safety system assessments.
- Maintain Voluntary Protection Program STAR Status.
- Improve total recordable case rate by implementing DuPont STOP program.
- Achieve pollution prevention and sustainable environmental stewardship goals set forth in DOE O 450.1.

8. ON CHANGING VALUES AND BEHAVIORS.

In many cases, implementing organizations will find that the desired ISM system will require changes to existing employee values and behaviors. Desired ISM values and behaviors are driven by the ISM principles and functions. Changes in values can not be dictated and, if possible, can only be brought about by concerted effort directed toward changing behaviors. In some cases, changes in personnel or leaders may be required to achieve the desired changes. To the extent possible, leaders should involve worker in

both formulation and implementation of the desired changes. To change behaviors, and ultimately values, it is necessary to do the following:

- Clearly define the desired behaviors in terms that the target audience can fully understand and appreciate.

- Establish consensus among the senior leadership regarding the desired behaviors and obtain their commitment to support the desired changes.

- Identify any actions or changes on the part of senior leadership to achieve the desired behaviors and obtain their buy-in to these actions.

- Identify existing organizational processes and behaviors that may be counter to the desired behaviors and develop actions to align existing processes and behaviors with new desired behaviors; take actions to eliminate or minimize the influence of forces that may be restraining achievement of the desired behaviors.

- Clearly communicate the desired behaviors to the target audience, and provide training as needed for the audience to master the desired behaviors.

- Encourage employees to ask questions to clarify intentions, and provide feedback and suggestions on achieving the desired behaviors. Be open to potential adjustments in expectations as a result of employee involvement and feedback.

- Working with members of the target audience, develop the necessary tools and supporting structures and processes, so that the desired behaviors can be consistently performed.

- Provide consistent, visible senior leadership attention and focus on new desired behaviors.

- Align rewards and incentives programs with desired behaviors.

- Provide positive reinforcement to employees performing desired behaviors, and not to employees who are not performing the desired behaviors.

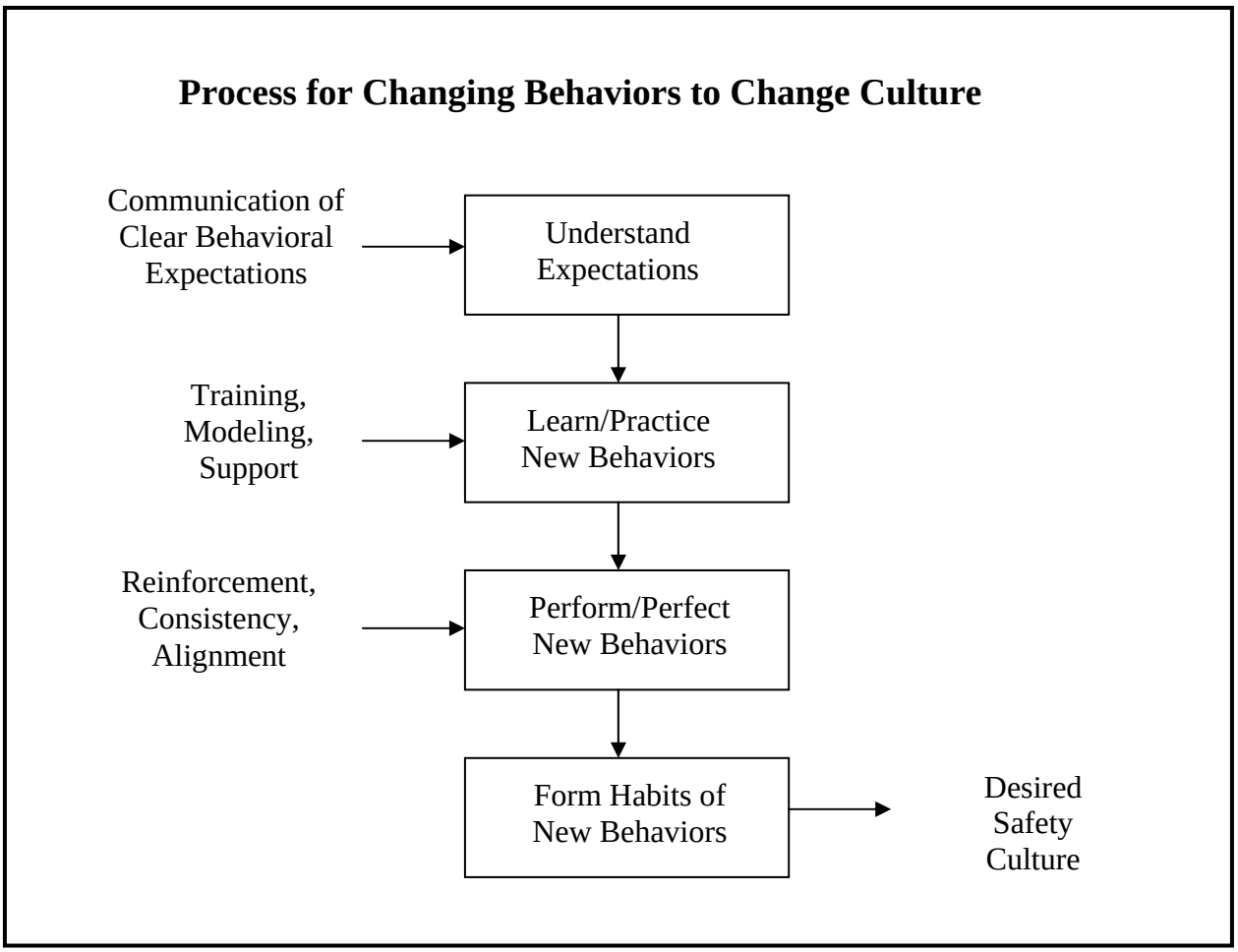
- Monitor performance and continue to provide direct, timely and specific feedback to employees regarding their behaviors.

- Periodically evaluate progress toward institutionalizing the desired behaviors and take actions necessary to continue progress.

- Communicate and train all new members, especially new leaders, on the desired behaviors, their objectives and bases.

- Reiterate and repeat the steps above, as needed, for at least five to seven years until the newly desired behaviors are well ingrained and institutionalized.

The figure below depicts the process of changing behaviors to achieve the desired culture changes.



GUIDELINES FOR IMPROVING DOE ISM SYSTEM IMPLEMENTATION

1. INTRODUCTION. The core function of "Feedback and Improvement" and the ISM supplemental safety culture element of "Organizational Learning for Performance Improvement" are expected to drive ISM system improvements. When these elements of the ISM hierarchy are fully realized, organizations will have a natural and regular flow of improvement opportunities. Many sources of feedback information are available to organizations, including:

   - Operational Awareness. Management walkthroughs, facility representative reviews, safety system oversight reviews, work observations, document reviews, meeting observations, ongoing interaction.

   - Worker Feedback. Pre-Job briefings, job hazard walk-downs, post-job reviews, employee concerns, employee hot-line items, employee suggestions, employee participation, safety meetings, labor organization input.

   - Internal Operating Experience. Occurrence reports, accident investigations, OSHA reporting (CAIRS), lessons learned identification, incident reporting below the threshold for ORPS reporting.

   - External Operating Experience. Safety bulletins, DOE lessons learned, special operations reports, Just-In-Time operating experience reports, Operating Experience weekly reports, Best practices from workshops, Benchmarking studies.

   - Assurance Systems. Issues management, QA discrepancy identification, suspect/counterfeit parts, safety system vertical assessments, self-assessments.

   - Oversight Reviews. Line oversight reviews (per DOE O 226.1), independent oversight reviews, external assessments such as Defense Nuclear Facilities Safety Board reviews, start-up and restart assessments, annual ISM effectiveness reviews, ISM integrative reviews (across multiple contracts or multiple sites), ISM full verifications, QA management assessments, For-cause reviews, performance evaluations.

   - Enforcement and Rewards. Price Anderson Amendments Act (PAAA) enforcement actions, PAAA non-conformance reports, contract enforcement actions, award fee determinations, conditional payment of fee clause penalties.

   - Performance Trending and Analysis. Performance measures (both leading and lagging indicators), identification of performance trends and performance concerns, safety system performance trending, ES&H reporting.

   - Integrated Analysis. Performance review against last year's safety performance objectives, measures and commitments; Identification of performance strengths and weaknesses; integration across feedback processes to identify major areas for

attention; development of next year's safety performance objectives, measures and commitments.

Feedback processes work at every level of the ISM system. Not all feedback information at the work activity level will be relevant at the facility or enterprise level. However, some of the feedback at the work activity level will have relevance at higher levels because the feedback surfaces latent weaknesses in the organizations processes or culture. Efforts should be made to provide means to elevate attention on relevant feedback information.

Ultimately, the ISM system should roll up feedback information relevant to the system itself or the system performance, and capture this information in the following key documents:

- Annual Summary Evaluation Report (on the results of the Annual ISM Effectiveness Review, culminating in the Annual ISM Declaration)

- Annual Safety Performance Objectives, Measures, and Commitments.

These documents should identify top-level strengths, weaknesses, and areas for improvement. They should report on the effectiveness of the ISM system, how it is measured, and how it is trending relative to prior years.

2. ANNUAL ISM EFFECTIVENESS REVIEW PROCESS.

The Annual ISM effectiveness review process is an essential element of ISM implementation that allows for taking evaluating implementation and making necessary adjustments. The annual ISM effectiveness review is a qualitative review that encompasses multiple elements, including review of: self-assessments, oversight reviews results, integrated reviews across multiple reporting elements; performance against established performance objectives, measures, and commitments; and other feedback and performance information. Elements of this review should be ongoing throughout the year, and should culminate in a review report that supports an annual summary evaluation. The purpose of the annual ISM effectiveness review is to:

- Determine the effectiveness of the ISM system in integrating safety into work performance, in supporting the safe performance of work, and in improving safety performance. [Note: In ISM, the term "safety" is used synonymously with environment, safety, and health (ES&H) to encompass protection of the public, the workers, and the environment.]

- Identify strengths of ISM system implementation for sharing with other DOE elements to aid improvements at other locations.

- Identify weaknesses of ISM system implementation to focus attention on corrective and improvement actions.

- Identify opportunities for improvement in efficiency or effectiveness of the ISM system, and identify actions for continuous improvement.

For field offices, the following steps are recommended to constitute the annual ISM effectiveness review:

Review Contractor Performance and ISM System Effectiveness

- Review the annual ISM review(s) and summary evaluation(s) performed by the contractor(s).

- Review the safety performance of the contractor(s) against the previous year's Safety Performance Objectives, Measures, and Commitments.

- Review the overall safety performance of the contractor(s), including results from various streams of feedback and improvement information.

- Review results of line oversight of the contractor(s); these line oversight reviews can and should be conducted throughout the year, as required by DOE O 226.1, *Implementation of Department of Energy Oversight Policy.*

- Review the completeness and accuracy of the ISM System Description of the contractor(s).

- Determine whether a full ISM verification of the contractor(s) is needed.

- If a full ISM verification is needed, perform it using guidance below.

- If a full ISM verification is not needed, document review and conclusions regarding effectiveness of the ISM program implementation by the contractor(s), basis for conclusions, strengths and weaknesses and areas for improvement.

- If more than one contractor, look at ISM program performance across all the contractors to identify and document any generic or broad-based strengths or weaknesses or areas for improvement.

Review DOE Field Office Performance and ISM System Effectiveness

- On DOE side, review self-assessment results regarding DOE ISM performance; these self-assessment reviews can and should be conducted throughout the year.

- Review DOE field office performance against the previous year's Safety Performance Objectives, Measures, and Commitments.

- Review the completeness and accuracy of the ISM System Description of the DOE field office, and make necessary changes. Determine whether an update is necessary. If an update is made, prepare a summary of changes.

- Review integrated DOE/contractor safety performance, including results from various sources of feedback and improvement information, including external and independent oversight findings.

Determine Annual ISM Effectiveness and Prepare Summary Report

- Based on all the prior reviews, reach an overall conclusion regarding the state of ISM effectiveness: (1) "Effective Performance – ISM is being effectively implemented," (2) "Needs Improvement - ISM is being effectively implemented, but noteworthy weaknesses need to be addressed," or (3) "Significant Weakness - ISM is not being effectively implemented." Provide the basis for this summary evaluation. Provide any immediate corrective or compensatory actions that must be taken.

- Prepare the annual summary evaluation report that documents the overall review process and conclusions regarding effectiveness of ISM system by the DOE office, basis for conclusions, strengths and weaknesses and areas for improvement, and corrective and improvement actions, with schedules for completion.

In judging effectiveness, both process measures and outcome measures should be considered. Examples of process measures include:

(1) implementation of each ISM function and each ISM principle,

(2) integration of ISM with other management systems,

(3) completion of ISM commitments,

(4) identification of weaknesses and improvement activities,

(5) satisfactory performance on process-based performance measures,

(6) positive feedback from oversight reviews.

Examples of outcome measures include satisfactory performance on outcome-based performance measures, including those related to safe identification of work activities.

In approaching annual ISM reviews, DOE offices need to guard against complacency and "by rote" compliance. For the annual ISM effectiveness reviews to add value, DOE offices should periodically take a fresh approach or use fresh personnel to perform the annual review. DOE offices may want to periodically take a more intensive focus on a specific area within ISM in their annual review and declaration. Organizations that question the value of annually reviewing the effectiveness of their ISM system are likely not approaching the activity with the proper attitude and desired commitment to reliable performance and real continuous improvement.

DOE field offices are recommended to determine and provide the criteria they will use to judge effectiveness to their contractors as early as possible, and preferably one year in advance, so that contractors can effectively focus their resources and efforts to meet expectations. Similarly, DOE field offices would benefit from early identification of effectiveness criteria in planning self-assessments and line oversight reviews. The criteria for determining effectiveness should be included in the ISM system description and updated annually, if changes are made.

For Secretarial offices, similar steps should be taken, first reviewing the DOE site office ISM reviews and declarations, etc. The Secretarial office should establish an overall schedule for field offices to report on annual ISM effectiveness reviews and provide annual ISM declarations, so that annual contractor reviews, declarations, and updates are all reported at the same time, and annual field office reviews, declarations, and updates are all reported at the same time. This is necessary to allow for annual roll-up reviews across contractors and across field offices. Annual safety performance objectives, measures, and commitments would also be completed on the same schedule, so that results from the previous year are reported along with the annual ISM effectiveness review.

DOE G 414.1-1A, *Management Assessment and Independent Assessment Guide*, and DOE DOE-HDBK-3027-99, *Integrated Safety Management Systems Verification Team Leader's Handbook*, provide additional information relevant to DOE ISM verifications.

3. ANNUAL SAFETY PERFORMANCE OBJECTIVES, MEASURES, AND COMMITMENTS.

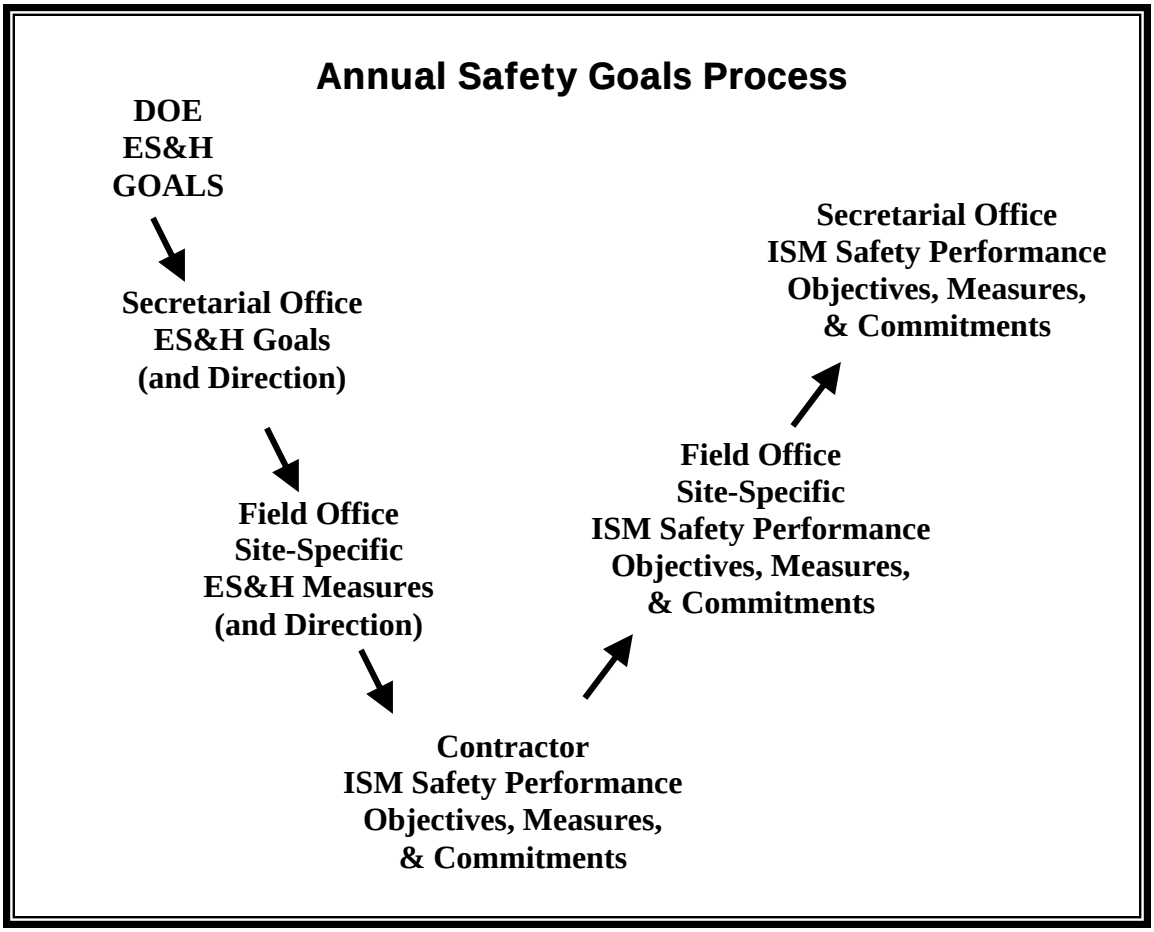
Each year, DOE field and Secretarial offices should develop ISM Safety Performance Objectives, Measures, and Commitments. The purpose of these is to set specific goals for key improvement initiatives and key safety performance metrics.

DOE P 450.7, *Environment, Safety and Health Goals*, establishes policy expectations that Secretarial office ES&H performance goals will be established annually, and site-specific ES&H performance measures will be established annually to drive performance improvement or maintain excellent performance. The DOE's ultimate ES&H goal is zero accidents, work-related injuries and illnesses, regulatory enforcement actions, and reportable environmental releases. This goal is to be pursued through a systematic and concerted process of continuous performance improvements using performance measurement. The ES&H goals are expected to drive performance excellence, thereby reducing or precluding other work-related injuries and illnesses, and adverse impacts to the public and environment.

The annual ES&H safety goals and metrics, established in accordance with P 450.7 must be fully integrated with the ISM Safety Performance Objectives, Measures, and Commitments. The following process is recommended:

- Secretarial offices will establish and communicate Secretarial safety performance goals, based on the established DOE safety performance goals.

- Secretarial offices may also provide direction to its field offices regarding expectations for their site-specific ISM Safety Performance Objectives, Measures, and Commitments.



- Field offices may also provide this information and direction to its contractors for input into the field office's site-specific safety performance measures.

- Field offices will develop their site-specific safety performance measures in response to Secretarial office safety performance goals and direction.

- Field offices may provide direction to its contractors on their contract-specific ISM Safety Performance Objectives, Measures, and Commitments.

- Contractors provide their contract-specific ISM Safety Performance Objectives, Measures, and Commitments for DOE field office approval.

- DOE field offices develop their site-specific ISM Safety Performance Objectives, Measures, and Commitments and provide them to the applicable DOE Secretarial office.

- DOE Secretarial offices develop their Secretarial office ISM Safety Performance Objectives, Measures, and Commitments and provide them to their applicable senior DOE official responsible for the DOE Secretarial office.

The timing of this annual process should be coordinated with the budget cycle, so that safety inputs to the budget process are made at an appropriate time to have an impact on future resources. The Secretarial office should establish and communicate an appropriate schedule to coordinate with the budget cycle. Once established, this schedule should be maintained, to the extent practicable, so that the annual process is predictable and manageable.

4. FULL ISM VERIFICATIONS.

DOE-HDBK-3027-99, *Integrated Safety Management Systems Verification Team Leader's Handbook* (June 1999) provides extensive direction and guidance on how to conduct full ISM verifications. DOE offices should use this direction and guidance in the conduct of full ISM verifications.

Full ISM verifications should be conducted at each site as needed. Some sites may decide to conduct full ISM verifications periodically, such as once every five years. More frequent full verifications may be appropriate where significant system or performance weaknesses are identified (see next section).

Some sites and field offices may decide and have decided to conduct full verifications every year. For these sites, the periodic full verifications will not differ significantly from the annual ISM effectiveness reviews. In general, full verifications differ from annual reviews as follows:

- Full verifications are led by a team leader who is not from the organization being reviewed.

- Full verifications have several team members who are not from the organization being reviewed.

- Teams for full verifications are typically at least 6-8 members, whereas annual reviews can be done with smaller teams.

- Full verifications are more intensive and more comprehensive, covering ISM system implementation in more depth than annual reviews.

The scope of these full ISM verifications is both the DOE site office and the associated site contractors. A representative appointed by the DOE Secretarial office should be part of the team, looking at the DOE site office ISM program. The field office manager may

appoint a qualified team leader for regularly-scheduled full ISM verifications. The Secretarial office would appoint the team leader, if the Secretarial office determined that a "for-cause" ISM verification was necessary.

It is a good practice to include team members from other Secretarial offices to foster shared learning.

5. CONDITIONS THAT COULD CAUSE DOE TO REQUIRE A FULL ISM VERIFICATION.

Under certain conditions, DOE may determine that one or more of its contractors need a full or partial ISM verification, in scope well beyond the typical annual ISM review. Similarly, under certain circumstances, DOE Secretarial offices may determine that one or more of its field offices need a full or partial ISM verification, in scope well beyond the typical annual ISM review, and direct the field office to conduct a verification. Alternately, the Secretarial Office might also decide to lead the ISM verification itself.

Conditions and considerations that could lead to some portion of or a complete ISM re-verification include:

- Significant changes in leadership personnel, such as a new site contractor, and several changes in the DOE management team,
- Significant changes in safety management approach, or significant revisions in the ISM system description,
- Loss of confidence in the existing ISM system description or its implementation,
- Significant safety problem or deterioration in safety performance,
- Significant findings from independent oversight (such as those conducted by the Office of Health, Safety and Security) or external reviews (such as those conducted by the Defense Nuclear Facilities Safety Board), calling into question the adequacy of the existing ISM system and implementation, or
- Significant changes in mission, such as a change from design/construction to operations or a change from operations to decontamination/decommissioning.

Annual ISM declarations should provide useful feedback into determining whether significant ISM performance problems exist. DOE field offices are encouraged to conduct full ISM verifications on a fixed periodicity, such as once every five years, to promote organizational learning and continuous improvement. Field offices should consider the scope and periodicity of assessment activities by outside groups in determining whether a full verification is needed. Tailoring the scope of the verification to focus on areas that have not received recent attention is a good practice.

Once the need is identified, ISM re-verifications should be conducted within a year.

6. CONTINUING CORE EXPECTATIONS.

The following continuing core expectation (CCE) statements are a compendium of relevant topics that can be used to aid in maintaining ISM systems and in developing an evaluation of the effectiveness of the ISM system. These can be used to guide annual effectiveness reviews or ISM verification reviews. This listing may be used by both contractors and DOE.

- CCE-1. The contractor updates the safety performance objectives, performance measures, and commitments, in response to DOE direction and guidance, so that they reflect and promote continual improvement and address major mission changes, as required. The ISM system description is updated and submitted for approval as scheduled by the contracting officer.

- CCE-2. System effectiveness, evaluated as described in the contractor's ISM system description, is satisfactory. Safety performance objectives, measures, and commitments are met or exceeded, and they are revised as appropriate for the next year.

- CCE-3. Work activities reflect effective implementation of the functions of ISM system. Work is defined. Hazards are identified. Actions to prevent or eliminate the hazards are taken. Controls are developed and implemented. Work is properly authorized. Work is accomplished within controls. Appropriate worker involvement is a priority.

- CCE-4. Contractor and DOE implementing mechanisms are established and implemented to provide an effective environment for ISM implementation, as embodied in the ISM guiding principles and supplemental safety culture elements. Roles and responsibilities are clear. Line management is responsible for safety. Required competence is commensurate with responsibilities and the technical and safety system knowledge of managers and staff continues to improve.

- CCE-5. Contractor and DOE budget processes ensure that priorities are balanced. Budget development and change control processes ensure that safety is balanced with production. Facility procedures ensure that production is balanced with safety.

- CCE-6. An effective feedback and improvement process, using progressively more demanding criteria, is functioning at each level of the organization from the worker and individual activities through the facilities and the site, including the ISM feedback and improvement process used by and within DOE. The requirements of DOE O 226.1 are implemented. Issues management is effective so that issues are identified, evaluated and closed. Issues identified in annual ISM effectiveness reviews and ISM system verifications are effectively addressed.

- CCE-7. List A/List B is reviewed and updated, as necessary, at least annually and concurrent with the budget cycle. The process for effecting changes to the standards and requirements identified in the Contract per DEAR List A and List B is being

utilized and is effective. Authorization Agreements and Authorization Basis documents are maintained current. Changes in agreed upon standards and requirements are included to reflect mission changes. An effective, dynamic process to keep standards and requirements current is apparent.

- CCE-8. Relevant performance records reflect an improving ISM system. Records include routine DOE and contractor self-assessment reports, independent and focused assessment reports, incident investigations, occurrence reports, DOE PAAA enforcement action reports, enforcement activity conducted by external state and Federal safety agencies, and other relevant documentation that provide evidence as to the status of implementation, integration, and effectiveness of the ISM system. Feedback, improvement and change control of the contractor ISM system description is in place and effective.

- CCE-9. DOE ISM system procedures and mechanisms are in place to ensure that work is formally and appropriately authorized and performed safely in a manner that protects the public, workers, and environment from harm. DOE line managers are involved in the review of safety issues and concerns and have an active role in authorizing operations.

- CCE-10. DOE ISM system procedures and mechanisms are in place to ensure that hazards are analyzed, actions to prevent or eliminate the hazards are taken, controls are developed, and that feedback and improvement programs are in place and effective. DOE line managers are using these processes effectively, consistent with the DOE Field Office FRA and DOE FRAM requirements. DOE ISM system procedures and mechanisms integrate ISM with QA, EMS, and other management systems.

CHARTER FOR THE ISM CHAMPIONS COUNCIL

1. PURPOSE.

The purpose of the ISM Champions Council (Council) is to support line management in developing and sustaining vital, mature ISM systems throughout the Department so that work is reliably accomplished in a safe manner. The Council will promote continuous learning and improvement of ISM effectiveness throughout the DOE complex.

2. BACKGROUND.

The Department established the Integrated Safety Management program in 1996 to integrate safety into all aspects of work activities to improve safety and work performance. The Department implemented the ISM program and declared initial implementation to be complete for most DOE activities in 2000. Through successive changes in Department leadership from 1996 to present, the Department has consistently indicated that ISM is its enduring safety management framework. DOE field office and contractor leadership have consistently supported the ISM framework, in part because it provides necessary flexibility to allow management systems to be tailored to local facilities and organizations. ISM provides a useful framework for understanding how work can be accomplished safely and for focusing efforts toward continuous improvement in safe and reliable work performance.

In recent years, it has become evident that sustained DOE leadership attention and emphasis on ISM implementation is necessary to sustain mature ISM systems, capable of consistent self-generated improvements. In some areas, worthwhile improvement efforts have moved forward, yet improvement is needed in consistency of approach and priority throughout all DOE sites. Clear leadership focus and attention is needed to keep ISM vital and strong, and to achieve the objectives of ISM including continuous improvement. This Council is intended to support line management in keeping ISM as an active and ongoing leadership value and commitment. The Council will also help facilitate a more integrated approach by the headquarters offices.

3. DURATION.

With the issuance of this Manual, the Department has a formal and rigorous mechanism for implementing ISM throughout the Department and identifying and sustaining continuous improvements. When the Council determines that its continued operations are no longer necessary or beneficial to building and sustaining the Department's safety culture, the Council will recommend its discontinuance to the Deputy Secretary along with its basis for concluding that other existing mechanisms are adequate to sustain effective ISM implementation and improvement.

4. MEMBERSHIP.

The DOE ISM Champion, who is designated to a one-year appointment (with an optional one year extension) by the Deputy Secretary, chairs this Council. To ensure the

necessary leadership and commitment for reinvigorating and sustaining ISM implementation at all levels throughout the DOE organization, each DOE Secretarial office (NNSA, EM, NE, SC, HS) and field office will designate an ISM Champion to support them in ISM implementation activities and in promoting continuous learning and improvement of ISM effectiveness. In selecting ISM champions, organizations should bear in mind the ISM principle that line management is responsible for safety. ISM champions for program offices should be at least at the level of Deputy Assistant Secretary or equivalent. ISM champions for site offices (including operations offices, field offices, and service centers) should be at least at the level of Assistant Manager or equivalent. The ISM Champions Council will also include the Chief of Defense Nuclear Safety for NNSA and the Chief of Nuclear Safety for the Under Secretary of Energy.

5. PRIMARY FUNCTIONS.

- Facilitate communications between DOE organizations regarding ISM implementation. Facilitate the identification of and sharing of lessons learned as the Department starts to implement the new requirements in the ISM manual.

- Promote and facilitate continued learning about safety management from both inside and outside the DOE community. Identify safety management programs and practices that are exemplary and worthy of benchmarking by other organizations.

- Sponsor and coordinate periodic ISM conferences as forums for DOE and contractors to share DOE expectations and guidance, disseminate best practices and lessons learned, develop consensus work products, and promote a robust safety culture for effective implementation of ISM systems. The Champions Council, in consultation with the Office of Health, Safety and Security, will determine the necessary periodicity and focus of these conferences; in general, the target is to hold DOE-wide ISM best practices workshop every 12-24 months.

6. SUPPORTING FUNCTIONS.

- As directed by responsible line managers, support responsible DOE managers in fulfilling their ISM responsibilities and requirements, and promoting effective ISM implementation and continuous improvement.

- Provide input and feedback on ISM expectations, methods, and best practices. As requested, provide input and recommendations on effective integration of ISM with other management systems. As requested, provide input on the development and revision of DOE directives and standards regarding ISM implementation and effective integration of ISM with other safety and management programs.

7. REPORTING.

The ISM Champion will report to the Deputy Secretary through the Chief Health, Safety and Security Officer, and provide such briefings and reports as requested by the Deputy Secretary to maintain awareness of ISM implementation and improvement activities.

8. SUPPORT

The DOE headquarters and field organizations will support the Council in fulfilling its purpose and performing its functions.