

ISMS Training Document
Track 2, Activity 16 – November 2009
Environmental Management System (EMS)

Activity

Describe the features of the Oak Ridge Office (ORO) contractors' Environmental Management Systems (EMS) that encompass such environmental management areas as environmental protection and compliance, waste minimization and pollution prevention, cultural resource management, sustainable design, green purchasing, and the National Environmental Policy Act (NEPA). Describe how EMS complements Integrated Safety Management Systems (ISMS).

At the completion of this activity, fill out the Self-Certification Form certifying that you have read this activity sheet.

Note: When regulations, Department of Energy (DOE) directives, or other industry standards are referenced in this ISMS activity, please use the most recent version. In addition, please note that DOE Guides provide preferred, non-mandatory, supplemental information about acceptable methods for implementing requirements, including lessons learned, suggested practices, instructions, and suggested performance measures. Guides do not impose requirements but may quote requirements if the sources are adequately cited. Alternate methods may be used if it can be demonstrated that they provide an equivalent or better level of performance.

Key Documents

- [DOE O 450.1, *Environmental Protection Program*](#)
 - [DOE G 450.1-1, *Implementation Guide for Use with DOE O 450.1, Environmental Protection Program*](#)
 - [DOE G 450.1-2, *Implementation Guide for Integrating Environmental Management Systems into Integrated Safety Management Systems*](#)
 - [DOE G 450.1-3, *Environmental Guidelines for Development of Cultural Resource Management Plans - Update*](#)
 - [DOE G 450.1-10, *Senior Managers' Implementation Guide for Use with DOE O 450.1, Environmental Protection Program*](#)
 - [DOE O 451.1, *National Environmental Policy Act Compliance Program*](#)
 - [DOE/EH-0573, *Environmental Management Systems Primer for Federal Facilities*](#)
 - ORO Directives Management Group, Key Management Documents, http://www.ornl.gov/doe/doe_oro_dmg/oro_keymanagementdoc.htm
 - ORO Office of Science Federal employees should also refer to the Office of Science Management System (SCMS): Environment, Safety, and Health, Subject Areas: *Environmental Authorization and Implementing the National Environmental Policy Act (NEPA) Within the Office of Science (SC)*, <http://scms.sc.doe.gov/>
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Definition

Environmental management systems are “that part of the overall management system which includes organizational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy.” (ISO 14001, Environmental Management System Standard)

Requirements

“All DOE elements must ensure that site ISMSs include an EMS that does the following.

1. Provides for the systematic planning, integrated execution, and evaluation of programs for:
 - a. public health and environmental protection,
 - b. pollution prevention (P2), and
 - c. compliance with applicable environmental protection requirements.
 2. Includes policies, procedures, and training to identify activities with significant environmental impacts, to manage, control, and mitigate the impacts of these activities, and to assess performance and implement corrective actions where needed.
 3. Includes measurable environmental goals, objectives, and targets that are reviewed annually and updated when appropriate.” (DOE O 450.1)
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What’s In It For Me

An effective EMS provides Federal managers with a predictable structure for managing, assessing, and continuously improving the effectiveness and efficiency of the management of their environmental activities. An EMS approach builds in periodic review by top management and emphasizes continuous improvement instead of crisis management.

The systematic nature of the EMS allows ORO to focus on management implementation and take a more inclusive and proactive view of environmental protection. By demonstrating improved environmental performance, an EMS can open the door to improved relations with regulators, stakeholders, and the public. By itself, an EMS does not guarantee performance or compliance. Regulators, communities, and environmental groups must see credible evidence that an EMS is being used to ensure compliance and advance environmental and mission goals.

The completion of this activity will help you gain an understanding of how the ORO sites’ EMSs are implemented.

EMS Elements

The basic elements common to Environmental Management Systems are:

1. *Policy*: A policy statement endorsed by top management.
 2. *Planning*: Identifying how operations impact the environment, setting goals and targets for reducing impacts, tracking legal and other requirements, and developing systems for environmental management.
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3. *Implementation and Operation:* Assigning roles and responsibilities, training, communication, documentation, and emergency preparedness.
4. *Checking and Corrective Action:* Establishing ways to monitor, identify and correct environmental problems.
5. *Management Review:* Management periodically stepping back and evaluating the performance of the EMS as a whole.

These basic elements of an EMS should already be familiar to most Federal managers. This familiarity allows agencies to use and adapt existing environmental management activities. Adopting an EMS approach rarely requires beginning from scratch. Many facilities will find they have most or all the elements of an EMS already in place. Complex sites, such as those with numerous program elements or host-tenant relationships, may be faced with multiple, inconsistent, or unrelated elements of environmental programs. A formal EMS can help draw together such elements, producing a clearly defined environmental policy statement and an integrated framework for environmental activities.

The ORO contractors at all major facilities were required to have an EMS in place and implemented by December 31, 2005. (Secretary Spencer Abraham, April 21, 2003)

EMS Scope

The following sections describe some of the key attributes and issues that the EMS encompasses.

Environmental Protection

Environmental protection is the goal and end result of the application of an ISMS/EMS (i.e., the integration of an EMS into an ISMS referred to as ISMS/EMS) that ensures early detection of and systematic management of environmental problems. To this end, effective ISMS/EMS implementation can create an organizational culture of superior environmental performance through increased environmental awareness and life-cycle accountability for everyone working at DOE sites.

Compliance and Regulations

Ensuring that a facility is in compliance with environmental laws and regulations is an essential component of an EMS. Given that compliance with environmental requirements is a baseline, an EMS can and should be viewed as a complement to a “command and control” compliance approach. Although an EMS focuses on management systems and not legal compliance per se, an EMS can be an important tool in an agency’s compliance system by improving the management of activities and programs that have significant environmental impacts. As a practical matter, an EMS should be integrated with a compliance system. An EMS is consistent with, and should not diminish or interfere with, a facility’s compliance management system.

NEPA

Federal managers have in place a set of tools to identify the environmental impacts of Federal activities, to consider these impacts fully in decision

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making, and to reduce these impacts. These tools (including procedures, data, and methods of analysis) have been developed over the past 25 years in response to the requirements of the National Environmental Policy Act of 1969 (NEPA). In developing an EMS, Federal managers have the opportunity to build on the strengths of these tools and to address some of their shortcomings.

NEPA also identifies requirements for Federal agencies. Federal agencies are directed to integrate the natural sciences, social sciences, and environmental design arts in planning and decision making, through a “systematic, interdisciplinary approach.” For major Federal actions, agencies are directed to prepare a detailed statement on the impact of the proposed action and of alternatives to the proposed action. It is this latter requirement and the substantial case law derived from it, which has led to the preparation of numerous Environmental Assessments and Environmental Impact Statements over the past few years.

At ORO, the ORO Manager is responsible for and has authority over reservation-wide NEPA actions. The ORO Assistant Managers have responsibility for and authority over NEPA actions initiated and limited to their program. ORO has an appointed NEPA Compliance Officer (NCO) that is responsible for specific actions such as:

- Developing ORO NEPA procedures and information management requirements, and documenting DOE’s compliance with those procedures and requirements;
- Providing advice on NEPA-related matters including provisions of the regulations and any related requirements and guidance;
- Making Categorical Exclusion determinations and approving and issuing any required associated floodplain and wetland documents; and
- Coordinating NEPA compliance strategies for matters within ORO’s purview.

Contractors may assist in the Department’s NEPA implementation; however, the legal obligation to comply with NEPA belongs to DOE.

**Pollution
Prevention and
Waste Minimization**

Pollution Prevention is “any practice which reduces the amount of any hazardous substance, pollutant, or contaminant entering any waste stream or otherwise released into the environment (including fugitive emissions) prior to recycling, treatment or disposal; and any practice which reduces the hazards to public health and the environment associated with the release of such substances, pollutants, or contaminants.” (Pollution Prevention Act of 1990)

As part of pollution prevention, waste minimization is any action that avoids or reduces the generation of waste by source reduction, improving energy usage, or by recycling. This action will be consistent with the general goal of minimizing present and future threats to human health, safety, and the

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environment.

The benefits of pollution prevention and waste minimization can be significantly enhanced through an EMS framework. By incorporating pollution prevention and waste minimization concepts into day-to-day operations, a facility can more easily extend its pollution prevention program to all elements of facility management. This approach can ensure broad awareness of pollution prevention issues, enhance relevant training and communication, and strengthen the facility's ability to recognize and capitalize on pollution prevention opportunities.

Because of past practices, portions of the Oak Ridge Reservation (ORR) are contaminated with radioactive elements, mercury, asbestos, PCBs, and industrial wastes. The ORR is on the Environmental Protection Agency's (EPA) national priorities list and is being cleaned up under a federal facilities agreement with EPA and the State of Tennessee. DOE also is focusing its resources to assess and clean up inactive waste sites and facilities, enhancing safe and effective waste management operations, emphasizing waste minimization, and coordinating applied waste research and development programs.

More specific waste minimization and pollution prevention activities at ORO include using ethanol-85 gasoline in the government vehicles; conserving resources, such as paper, by using electronic information sharing; recycling materials like paper, cardboard, plastic, aluminum cans, batteries, printer cartridges, and electronic media; and purchasing recycled materials or reusing materials, where feasible.

**Cultural Resources
Management**

Preservation and protection of America's cultural heritage are important functions and responsibilities of DOE for properties under its control or jurisdiction, and DOE must comply with Federal law in the protection and interpretation of historic properties and scientific equipment. Federal laws and regulations require DOE to identify, evaluate, and manage such cultural resources. The significance of cultural resources owned by DOE and its predecessor agencies have been recognized for a number of years and efforts have been made to identify and evaluate these resources.

A consolidated, proactive DOE cultural resource management program that is responsive to cultural resource laws and implementing regulations has been developed for ORO and NNSA. Numerous actions related to management of cultural resources on the ORR have been completed which include such actions as:

- Cultural Resource Surveys for the Sites: ORNL (X-10) (1994), ETPP (K-25) (1998), and Y-12 (1999);
- Cultural Resource Management Plan (July 2001);
- Y-12 Historic Preservation Plan (HPP) (September 2003),
Programmatic Agreement (PA) for the Y-12 National Security

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Complex (NSC) (August 2003), and the Interpretive Plan on Historic Preservation for the Y-12 NSC (January 2005);

- ORNL (X-10) HPP and PA (February 2005); and
 - East Tennessee Technology Park (ETTP) Memorandum of Agreements (MOAs) to determine the appropriate mitigation to preserve, interpret, and commemorate the significance of the K-25/K-27 Buildings and the balance of the site (July 2003, April 2004, and March 2005).
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Sustainable Design

Pollution prevention and energy efficiency (P2/E2) has become a powerful tool and prudent business practice for cutting the rising costs of waste management over the life of a facility, including facilities throughout the DOE complex. In addition to enhancing environmental quality, practicing P2/E2 also creates a positive public perception.

Sustainable design (SD) is the systematic consideration, during the design process, of an activity, project, product or facility's life cycle impacts on the sustainable use of environmental and energy resources. This means the design strives for safe, energy efficient, and environmentally responsible facilities and operations.

Sustainable design is becoming the preferred method to ensure that facility design, construction, operations, and decommissioning are safe, energy efficient, and environmentally responsible. To successfully respond to these drivers, each DOE organization and operations office actively seeks out and funds beneficial SD opportunities that enhance environmental quality and save taxpayer dollars. A new facility can dramatically reduce waste generation levels and waste management costs and increase energy efficiency over its life span when SD options are considered during the design phase. Several operations offices have begun to adopt better management practices that take into account full life cycle impacts rather than just construction costs.

Green Purchasing

Green Purchasing (formerly Affirmative Procurement and now also known as Environmentally Preferable Purchasing) refers to the practice of preventing waste and pollution by considering environmental impacts, along with price, performance, and other traditional selection factors, when making purchasing decisions. Green purchasing often is included within the definition of pollution prevention, since the selection and use of green products can reduce both the quantity and toxicity of waste streams. All Federal procurement officials are required by the Federal Acquisition Regulation (FAR and Executive Order (EO)13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, to assess and give preference to green products and services. Part 23 of the FAR addresses acquisition policies and procedures for protecting and improving the environment by controlling pollution, managing energy and water use in government facilities efficiently, using renewable energy and renewable energy technologies, and acquiring

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energy- and water-efficient products and services, environmentally preferable products, and products that use recovered materials.

EO 13423 requires agencies to consider the following factors in acquisition planning for all procurements and in the evaluation and award of contracts: “elimination of virgin material requirements; use of biobased products; use of recovered materials; reuse of product; life cycle cost; recyclability; use of environmentally preferable products; waste prevention (including toxicity reduction or elimination); and ultimate disposal.”

Federal green purchasing preference programs are designed to provide agencies with reliable product information to support and encourage their efforts to purchase green products and services. Currently, Federal green purchasing preference programs include:

- Products manufactured from recovered materials (Recycled content products),
- Environmentally preferable products
- Energy efficient products,
- Biobased products,
- Alternative fuels and fuel efficient vehicles,
- Non-ozone depleting substances, and
- Priority chemicals.

How EMS fits into ISMS

DOE senior management has recognized that an Environmental Management System can play an important role in articulating the environmental component of the Integrated Safety Management System.

DOE O 450.1 requires DOE elements to establish an EMS that is integrated into a DOE site’s ISMS. The integration of an EMS into an ISMS (i.e., ISMS/EMS) provides a unified strategy for the management of resources; the control and attenuation of risks; and the establishment and achievement of the organization’s environment, safety and health goals. The ISMS/EMS should be viewed as an enhancement of ISMS that adds those EMS elements not previously included in the ISMS. The guidance contained in DOE G 450.1-2, *Implementation Guide for Integrating Environmental Management Systems into Integrated Safety Management Systems*, recognizes that many DOE sites have already implemented ISMSs and should, therefore, have most if not all of the elements of an EMS already in place. DOE G 450.1-2 focuses on providing guidance to assist DOE sites in identifying those missing EMS elements and integrating them into the site’s ISMS.

At ORO sites, the ISMS integrates all the elements of quality assurance, environment, safety, and health into one system. This system promotes the full inclusion and integration of environmental, safety, health, and quality assurance into the totality of work, such that it is an integral part of the

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whole—not a standalone program.

Summary

An EMS is a formal system for managing the environmental footprint of ORO. The EMS and related measurement tools alone, do not guarantee success. A useful EMS is a living process, constantly measuring performance, making adjustments, and looking for continual improvement opportunities.

To Learn More

Click on these documents for more information about the ORO Environmental Management System.

- [DOE/EH-0573, *Environmental Management Systems Primer for Federal Facilities*](#)
 - [DOE O 450.1, *Environmental Protection Program*](#)
 - [DOE G 450.1-1, *Implementation Guide for Use with DOE O 450.1, Environmental Protection Program*](#)
 - [DOE G 450.1-2, *Implementation Guide for Integrating Environmental Management Systems into Integrated Safety Management Systems*](#)
 - [DOE G 450.1-3, *Environmental Guidelines for Development of Cultural Resource Management Plans - Update*](#)
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