

CHAPTER 28 – ENVIRONMENTAL MANAGEMENT SYSTEMS

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CHAPTER 28 - ENVIRONMENTAL MANAGEMENT SYSTEMS

A. INTRODUCTION

1. Smithsonian Institution (SI) environmental management programs span a wide range of disciplines and functions with significant potential to impact human health or the environment if not effectively managed. This chapter sets forth guidance for an Environmental Management System (EMS) that will enable a facility to manage its diverse environmental compliance requirements, pollution prevention programs, and operational activities in a manner that protects and sustains the quality of impacted ecosystems.
2. EMS applies to all SI facilities and is the preferred tool for program management.
3. The unique activities, protocols, and cultures of SI units vary significantly; therefore, the EMS for each operational entity must accommodate the specific activities involved. Similarly, the intensity of training required for a given staff to successfully and safely complete their duties varies by facility. For these reasons it is not practical for this Chapter to prescribe details for creating an EMS for a given organization. This Chapter, therefore, will identify the underlying principles of an EMS and explain how they should be applied within the SI. OSHEM, in its role as staff proponent of environmental management, will provide additional implementing assistance for identifying regulatory requirements, required training and best management practices (BMP), as well as monitoring and audit of activities.

B. EMS POLICY GUIDANCE

1. **Three pillars of environmental policy.** Successful, robust, and pro-active EMSs foster pollution prevention, compliance with applicable laws and regulations, and strive for continual improvement. Sound environmental policy is founded upon the fundamental elements as shown in Figure 1. These are: compliance with Federal, state, and local regulations; continuous improvement in implementation of the best management practices; and prevention of pollution through material substitution or elimination at the source. These three elements must be applied in a complimentary, mutually-supportive, consistent manner in order to develop and sustain a sound environmental management system.

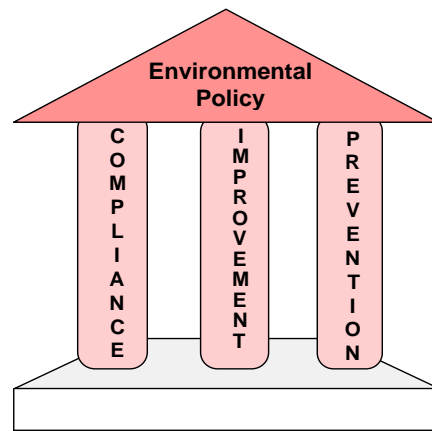


Figure 1 Three Pillars of an Environmental Policy

2. **SI EMS implementation.** SI EMS implementation is based on the International Standards Organization (ISO) 14001 model. ISO 14001 is a widely accepted international standard for EMS that focuses on fundamental environmental compliance practices that embrace continual improvement; it is also reflected in the key elements found in many other EMS models including the Code of Environmental Management Principles for Federal Agencies and EPA’s Performance Track program.
3. **Resource Aids.** The ISO 14001 model is described in [Environmental Management Systems: An Implementation Guide for Small and Medium-Sized Organizations, Second Edition, January 2001 \(EMSG\)](#). The EMSG is the working document that shall be used for guidance in developing an EMS for individual Museums, Research Institutes, and Offices. **References to this document will be identified as “EMSG”, followed by the specific page number, throughout this Chapter. The cited references provide guidance and templates to be followed in implementing the EMS program within SI organizations.**

C. REQUIREMENTS FOR AN EMS

The major elements involved in creating an EMS within an organization, and the underlying reason for implementing the step, are outlined below. A graphic model for EMS Implementation is detailed in [Attachment 1](#).

1. **Management Commitment.** Each organization shall publish a written policy statement that commits the organization to reducing pollution and degradation of the environment related to its activities by applying the principles of pollution prevention, compliance with relevant laws and regulations, and continual improvement. A written policy statement demonstrates to employees and the public that upper management is sincere in its commitment to protecting the environment and that it is a top organizational priority.

2. Identification of Applicable Environmental Management Program Areas.

Each facility shall examine its operations to identify and document any activity or equipment that has the potential to pollute or otherwise degrade the environment. This step is a practical application of the concept of identification being the logical starting point for any attempt to eliminate or reduce harm that an activity may pose to an ecosystem. For the purposes of this Chapter, examples of environmental management program concerns within a Museum, Research Institute, or Office may include:

- a. Sources that emit hazardous air pollutants under the Clean Air Act (CAA) [40 CFR Parts 50-99], burn fossil fuels, or have other impacts on air quality that may require a permit. Examples include boilers, emergency generators, and spray paint booths.
- b. Sources that discharge directly to a public sewer system or other body of water. Point source and non-point source water pollutants, effluents or other discharges that may exceed standards or require a permit under the Clean Water Act (CWA)[40 CFR Parts 100-145, 220-232, 410-471]. Examples include storm water runoff from the property, pre-treatment permits or otherwise discharging chemicals to a drain system.
- c. The application of pesticides regulated under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) [40 CFR Parts 150-189] Examples include pest control, treating swimming pools or fountains, algae control of air conditioning cooling towers.
- d. Activities that may produce hazardous wastes identified by the Resource Conservation and Recovery Act (RCRA)[40 CFR Parts 240-299] Examples include solvents, expired chemical products, fluorescent light bulbs, batteries, and used oil.
- e. Storage of petroleum products or hazardous materials in underground (UST) or above-ground storage tanks (AST). Tanks may be subject to regulation pursuant to RCRA, the local Fire Department, the Emergency Planning and Community Right-to-know Act (EPCRA) and the Spill Prevention Countermeasures and Control (SPCC) requirements of the Clean Water Act.
- f. The use, development, manufacture, distribution, and disposal of certain chemicals are subject to specific management standards such as the Toxic Substances Control Act (TSCA)[40 CFR Parts 700-799] Examples include Asbestos and Polychlorinated biphenyls (PCBs)
- g. There may be reporting requirements under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, also known as "Superfund") [40 CFR Parts 300-311] should you discover contamination at a site during an excavation, or release a hazardous substances over a certain quantity.
- h. The Emergency Planning and Community Right-To-Know Act (EPCRA) [40 CFR Parts 350-374] has an annual reporting requirement should specific chemicals be used, processed or stored over specified quantities.

3. Implementation of Compliance, Risk Reduction, and Pollution Prevention Measures.

- a. After all the environmental activities and program areas have been identified, the organization shall determine the best management practices for ensuring that all activities are conducted in conformance with regulations and with the least negative impact on the ecosystem. The purpose of this step is to develop written standard operating procedures (SOPs) that ensure consistency in the application of the most protective controls and eliminate potential non-compliance penalties. An example of an SOP is demonstrated in the development and writing of the Hazardous Waste Management Plan (HWMP), explained in [Chapter 29, "Hazardous Waste Management"](#), of this *Manual*.
 - b. The organization shall demonstrate strategies for Pollution Prevention (See [Attachment 2 – Pollution Prevention \(P₂\)](#)) as part of their environmental risk reduction efforts.
 - c. The organization shall minimize and discourage the drain disposal of any potentially hazardous substance that has not been treated to eliminate its potential to degrade the ecosystem.
4. **Self-Assessment and Continual Improvement.** Using the self-assessment and hazard tracking tools explained in [Chapter 4, "Safety Risk Management Program"](#) and [Chapter 5, "Safety Assessments, Log of Deficiencies and Corrective Action Plans"](#), of this *Manual*, each organization shall continuously monitor activities to identify problems, assess risks, correct deficiencies, and install interim controls until deficiencies are abated. The purpose of this step is to ensure that objectives are being met and to identify opportunities to improve the environment so that it remains capable of sustaining life.

D. ROLES AND RESPONSIBILITIES

1. **Directors** shall ensure:
 - a. Cohesive oversight and management of facility environmental programs through the designation of a Qualified Responsible Person.
 - b. Development of Environmental Policy and Management Review Systems for their organizations. A thorough explanation of the step-by-step procedures for these topics can be found in the [EMSG](#), pages 16 and 77, respectively.
 - c. The application of EMS principles to the environmental areas of their organization. To initiate and sustain the EMS effort, top management must endorse a policy statement that communicates to all employees the importance of:
 - (1) Making the environment an organizational priority (view effective environmental management as fundamental to the organization's survival); and

- (2) Integrating environmental management throughout the organization (view the environment as part of the product, service, process development, deliverables, or other activities)

The Environmental Policy Worksheet on page 19 of the [ESMG](#) lists items to be considered when reviewing your organizations Policy statement. Examples of Policies are on page 91 of the [ESMG](#).

- d. That adequate resources are provided to develop and administer an environmental management program; potential environmental impacts of proposals shall be addressed in the earliest stages of formulating plans, actions, and programs; and all activities shall promote the protection, conservation, and management of watersheds, wetlands, natural landscapes, soils, forests, fish, wildlife, and other natural resources.
- e. The appointment of a cross-functional team with representatives from key operational areas within the organization (such as safety, building management, research, engineering, maintenance, protective services, horticulture, etc.) to identify and assess environmental issues, opportunities, and existing processes. The team can also ensure that procedures are practical and effective and help build commitment to and “ownership” of the EMS.
- f. Promotion of a process of continual improvement to protect and enhance the quality of the environment by reviewing all reports of inspections, program assessments, and METR findings, and ensuring that corrective actions are initiated and completed in a timely manner.
- g. That permit conditions, demand for payment of SI funds, compliance agreements, settlements, negotiations, and responses to Notices of Violation (NOV) from environmental agencies are coordinated with the Office of the General Counsel (OGC), and the Office of Safety, Health, and Environmental Management (OSHEM).
- h. Promotion of environmental training and education, pollution prevention, and the integrated management of natural resources as the long-term strategy for achieving and maintaining environmental compliance.

2. **Qualified Responsible Person shall:**

- a. Exercise the authority of the Director for the organization, management, and administration of the environmental management program and cross-functional team.
- b. Conduct reviews of the organization’s current operations, activities, processes, systems, and equipment to identify areas that have the potential to impact living things, or the air, land, or water (ecosystem). **Anything with an impact is defined as an “Aspect”.**
- c. Choose criteria for evaluating the significance of the identified aspects. Significance refers to taking into consideration the importance of the activity to the operation of the facility, or if it is regulated, or how it impacts its surroundings, etc. Evaluate each Aspect to determine which are significant enough to warrant attention and document the procedure.

- d. Coordinate with OSHEM to identify the applicable statutory, regulatory, or policy guidelines, and environmental management practices, that achieve compliance for each Aspect.
 - e. Identify and document the objectives and targets for the management of each selected significant environmental Aspect. An objective is the overall goal; the target is a detailed explanation of how to achieve the objective. For example, the objective may be to reduce waste generation by 10% per year; the target would then identify ways to achieve this. Basic compliance is a minimum target; the ultimate goal is to identify and capitalize on environmental opportunities that go beyond compliance.
 - f. Serve as the repository for documentation associated with the organizations EMS.
 - g. Schedule and conduct routine assessments to identify shortfalls or "gaps" in the organizational EMS.
 - h. Coordinate the implementation of EMS awareness training and assist Supervisors in the implementation of the EMS.
 - i. Advise upper level management on matters related to implementation of this policy.
 - j. Prepare annual reports to OSHEM on the status of environmental compliance and EMS initiatives.
3. **Supervisors** shall:
- a. Assist the QRP in determining what objectives and targets are appropriate for the activities within the scope of their authority. Identify impediments to achieving the targets.
 - b. Communicate EMS objectives to employees and ensure they understand the actual environmental improvements being sought. Encourage employees to help determine how to best achieve the result.
 - c. Develop protocols and implementation procedures for meeting compliance objectives and targets. All procedures shall be written and maintained in an area selected for its ease of access to employees.
 - d. Delegate responsibility to employees in the relevant functional area(s) for implementing the procedures necessary to achieve the objectives and targets. The selected employees shall be sufficiently knowledgeable and trained to achieve these goals.
 - e. Provide and/or secure appropriate-level environmental management training for all employees under their authority. See individual operational chapters and [Chapter 2, "Roles and Responsibilities"](#), of this *Manual* for specific training requirements.
 - f. Monitor for the consistent application of environmental policies within the scope of their authority and elevate issues of interest to the appropriate manager.
 - g. Establish, implement, and document a routine assessment procedure to identify shortfalls or "gaps" in the execution of the EMS. Initiate corrective

action as soon as practical upon identification of deficiencies and/or recommend appropriate actions to correct deficiencies.

4. Office of Safety Health and Environmental Management (OSHEM) shall:

- a. Ensure that decision makers are informed of the consequences, alternatives, and mitigating factors that must be considered regarding decisions that have the potential to impact the environment by:
 - (1) Assisting facility staff with interpreting Federal, State, and local regulatory requirements and resolving disputes with these entities by serving as the focal point for information and the coordination of issues related to SI environmental activities.
 - (2) Supporting processes for environmental planning and analysis, ensuring that environmental protection and pollution prevention alternatives are considered in the decision making process for all SI actions.
- b. Provide assistance and guidance in implementing an effective EMS and compliance program and the preparation of required protocols. Advise and support organizational management in carrying out environmental management responsibilities.
- c. Coordinate and conduct assessments, audits, monitoring, technical reviews, and management evaluations for the purpose of identifying shortfalls or "gaps" in the current system. Recommend appropriate actions to correct deficiencies.
- d. Recommend program policies, directives, alternate or supplemental standards, and guidelines for adoption at the organization or facility level.
- e. Participate in committees or working groups and otherwise cooperate with SI facilities regarding environmental issues of common interest. Assist with the identification, coordination, development, and conduct of general and specialized environmental training designed to meet individual organizational needs.
- f. Develop and maintain environmental education and training programs aimed at providing information to large target audiences, to include making available and recommending materials, journals, reference documents, posters, signs, etc.

E. TRAINING

A discussion of training needs is covered in the [ESMG](#) on page 40. Training will vary and be tailored based on the operation(s) being conducted in accordance with guidance outlined in the EMSG, and with the assistance of OSHEM.

F. REQUIRED INSPECTIONS AND SELF ASSESSMENTS

Guidance on assessing how well the system is performing is found in [ESMG](#) on pages 61 and 145. Inspections are to be conducted in accordance with standards and regulations found in the EMSG and will be applied during self inspections and the METR process (refer to [Chapter 5, "Safety Assessments, Log of Deficiencies and Corrective Action Plans"](#), of this *Manual*).

G. RECORDS AND REPORTS

Recordkeeping and reporting requirements are determined by the processes and activities that a facility engages in to fulfill their purpose and the corresponding environmental program areas that are subject to regulation. An example would include the Federal RCRA requirement to maintain records of all off-site shipments of hazardous wastes, followed by biennial reporting of the combined totals of those shipments during each even-numbered year. The management of records and reports is specific to individual facility circumstances. The management of records and reports for the EMS is discussed in the [ESMG](#) on page 70.

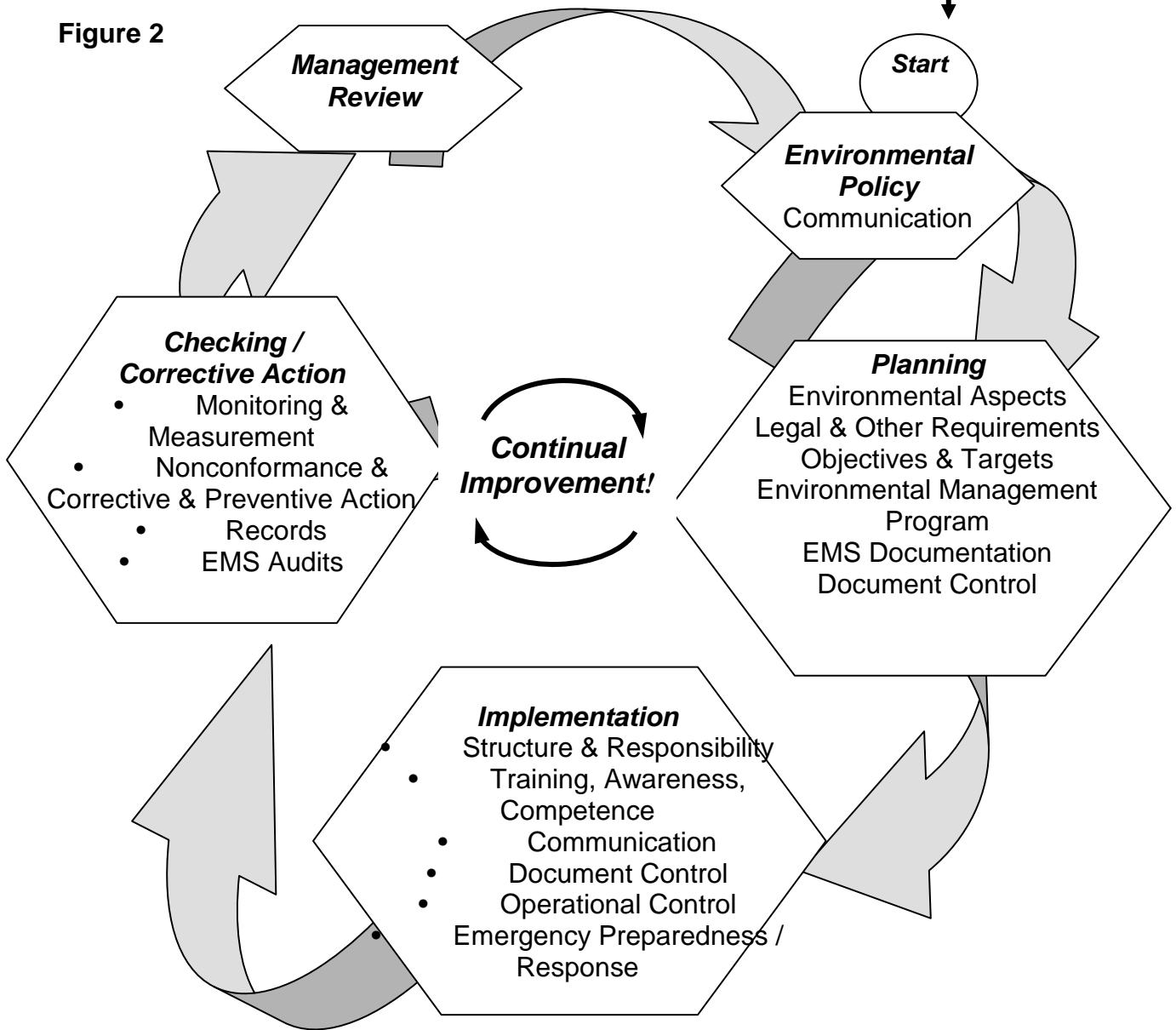
H. REFERENCES

1. [Environmental Management Systems: An Implementation Guide for Small and Medium- Sized Organizations, Second Edition, 2001](#)
2. Pollution Prevention Act (PPA) of 1990 (42 U. S. C. 13101 et seq.)
3. Executive Order (EO), 13148, Greening the Government through Leadership in Environmental Management, April 2000
4. [The Yellow Book: Guide to Environmental Enforcement and Compliance at Federal Facilities](#)
5. Executive Order 13423 (E.O.), Strengthening Federal Environmental, Energy, and Transportation Management, January 2007

Model for EMS Implementation

An EMS is built on a modified “Plan, Do, Check, Act” model as illustrated in Figure 2. The following model generally applies to most SI facilities, but will vary according to the complexity of operations. Following this model ensures that environmental management program issues are systematically identified, controlled, and monitored and that the performance of the EMS improves over time. This Chapter identifies how the model can be integrated into the SI organizational structure in general and is not intended to demonstrate its applicability to any one specific environmental program area. Each element in the model in Figure 2 has been expanded in detail and examples are given of how the EMS may be implemented operationally in the [EMSG](#).

Figure 2



Pollution Prevention (P₂)

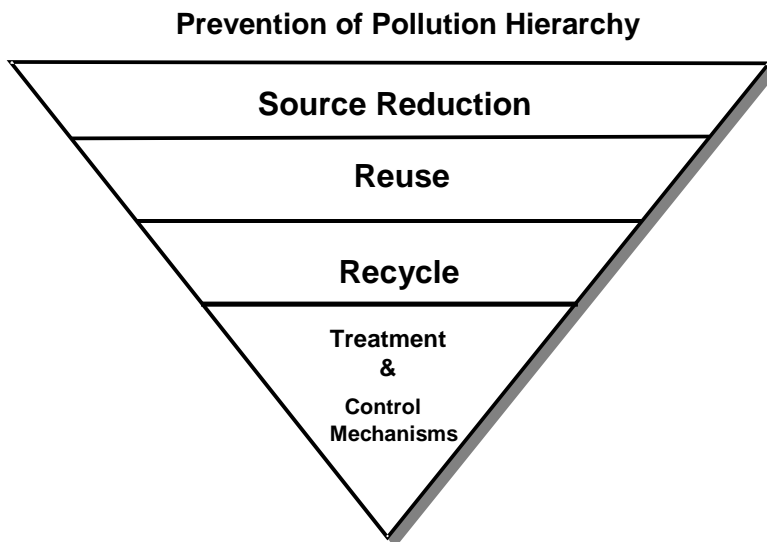
The term Pollution Prevention as used in this *Manual* refers to activities identified under Section 6602 (b) of the Pollution Prevention Act of 1990, wherein the U.S. Congress established a national policy that whenever feasible:

- Pollution should be prevented or reduced at the source;
- Pollution that cannot be prevented should be recycled in an environmentally safe manner;
- Pollution that cannot be prevented or recycled should be treated in an environmentally safe manner; and
- Disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner.

Over the years these principles began to be commonly known as the *Reduce-Reuse-Recycle* policy, also an inverted triangle is often used to represent the P₂ hierarchy.

Figure 3 shows an example of a P₂ hierarchy triangle. Different versions of the triangle exists however they all express the principles of the 1990 Pollution Prevention Act.

Figure 3



The P₂ principles identified by the U.S. Congress in the 1990 Act shall be the underlying philosophy that guides SI in the management of all materials used throughout the organization. These principles shall be incorporated into all Environmental Policy statements.