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Environmental Management Systems (EMS)

Implementation Guide for the **Foundry Industry**

April 2004

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ACKNOWLEDGMENTS

This Environmental Management System Implementation Guide for the Foundry Industry was developed by the Sector Strategies Division of the U.S. Environmental Protection Agency (EPA) Office of Policy, Economics and Innovation in partnership with the American Foundry Society and Indiana Cast Metals Association.

This EMS Guide is a combination of examples and tools from EPA-sponsored EMS source documents and actual industry examples developed during the EPA Sector Strategies Foundries EMS pilot. Important contributions were made by the following individuals and organizations: Amy Blankenbiller and Dwight Barnhard, AFS; Blake Jeffries, INCMA; Kathy Cole, Fort Wayne Foundry; John Haney, Atlas Foundry; Cynthia Hann, Dalton Foundry; Ken Moore, Interstate Castings; Kyle Morton, Bremen Castings; Doug Smith, Rochester Metal Products; and Jim White, Grede Foundries, Inc.

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INTRODUCTION AND USER'S GUIDE

This Environmental Management System Implementation Guide for the Foundry Industry (EMS Guide) is a combination of examples and tools from EPA-sponsored EMS source documents and actual industry examples developed during the EPA Sector Strategies Foundries EMS pilot.

The EMS Guide is meant to assist foundries in weaving environmental decision-making into the fabric of the way they do business. The purpose is not only to achieve better compliance assurance, but also to improve environmental performance in areas such as resource conservation, energy efficiency, water-use efficiency, land use, and mitigation of impacts associated with noise, odor, and dust. As a result of comprehensive planning, rigorous implementation, regular checking, and effective corrective action, EMSs are helping foundries to consistently meet their environmental goals and commitments. Foundries that have an effective EMS are becoming more efficient and more competitive.

Many foundries have components of an EMS already in place. This EMS Guide encourages the user to identify and build on existing components whenever possible. It describes an EMS that is based on the elements of the ISO 14001 Standard and also incorporates EPA's National Environmental Performance Track emphasis on sustained compliance, pollution prevention, and information sharing with the community. Though there are other types of EMSs that one could adopt, and EPA does not specifically endorse any individual EMS standard, the ISO 14001 EMS is the most widely recognized and one that many companies are beginning to require their suppliers to adopt. Therefore, moving in the direction of implementation and maintenance of an EMS based on the ISO 14001 Standard may be a wise business decision. The choice to build an EMS that, if desired, could be certified in the future, may make sense for you based on your business goals and needs. Facilities implementing an EMS that meets the requirements of the ISO 14001 Standard can either self-declare conformance or seek third-party registration.

To facilitate your implementation process, this EMS Guide contains 17 modules – an initial laying-the-groundwork module followed by 16 modules, each of which corresponds to an EMS element. Each module contains:

- Guidance that explains the EMS element and recommends what should be established and maintained for this element to be suitable and effective;
- A set of review questions and worksheets that are meant to be used as tools to make EMS adoption easier and more thorough;
- Sample procedures as required by the ISO 14001 Standard, and accompanying forms that will be used to document conformance with the procedures. The tools are meant to serve as templates that can be customized by your foundry to define roles, responsibilities, activities, and recordkeeping for that EMS element; and
- Examples of how a foundry might document and record information associated with the requirements of its EMS. Usually these are examples of how to complete the recommended forms.

The EMS Guide recommends that facilities establish, at a minimum, the several documented procedures required by the ISO 14001 Standard. In this EMS Guide are sample procedures and other examples of how a foundry might document and record its EMS. Revising these examples should be much easier than starting with a blank page. However, when using these examples, it is crucial to review the requirements of your facility in accordance with company policies and the most recent federal, state, and local requirements.

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MODULE 1: LAYING THE GROUNDWORK FOR EMS

Guidance and Tools

EMS Planning – Getting Started

Section 4.4.1 of the ISO 14001 Standard outlines requirements for structure and responsibility within an Environmental Management System. Identifying primary roles and responsibilities is covered more thoroughly in *Module 7* of this manual. However, in order to begin building an Environmental Management System, a few key individuals must be identified. This section provides tips on getting started.

A primary role is the EMS Coordinator, who will be responsible for managing the day-to-day EMS tasks at the facility. The EMS Coordinator will work with an Environmental Management Representative (EMR), who is a member of the facility's top management group. These assignments should be documented in a position description that defines the responsibilities and duties associated with the role and on relevant organization charts. Note that in a small business, the EMR could be the owner. Additionally, the roles of EMS Coordinator and EMR could be filled by the same individual.

Next, facilities typically identify a team of individuals (Cross Functional Team (CFT)) that will help implement the EMS. There are no requirements for how many people should be on the team or what types of people should be assigned to the team. Following are some general guidelines for successful team building:

- The Management Representative typically chairs the team meetings. Appoint someone to record meeting minutes.
- Team members should be selected from different areas, functions, and levels within the plant (Quality, Operations (melting, molding, finishing, etc.), Shipping/Receiving, Engineering, Maintenance, Finance, Human Resources, etc.). One of the most valuable components of building the EMS is providing the time for these individuals to discuss environmental issues together.
- Assign only those who are interested and can spend the time (at least 40 hours over the course of implementation).
- Document designation of Cross Functional Team members either with a memo from the Facility Manager or on an organizational chart. Post these on bulletin boards to raise general awareness.
- Try to limit Cross Functional Team meetings to 4 hours or less. Weekly meetings for shorter periods tend to be more successful than longer meetings held only once a month.

EMS Planning – Gap Analysis

The facility should conduct an initial review or "gap analysis" to understand what is already being done and to evaluate ways to improve and build on existing programs and activities. This is an important part of laying the groundwork for your EMS.

A gap analysis is designed to answer the following questions:

- How well are the organization and its environmental programs performing?
- What standards of environmental performance does the organization hope to achieve?
- What parts of the ISO 14001 EMS do we already have in place, even partially?
- Where are there gaps between objectives and performance?
- What existing programs and activities can serve as the best foundation for improved environmental performance?

Through this process, many organizations will probably find ways to address some of the EMS components at little or no cost.

Prior to beginning the gap analysis, it is helpful to pull together materials you will be referencing. **Tool 1-1** is a list of materials that can be useful in conducting a gap analysis. Not all of these will be applicable to your specific facility, and not all of them are necessary to conduct a gap analysis. The list is, however, a good reference to consult as you prepare for your gap analysis.

Tool 1-2 is a gap analysis tool/self-assessment checklist that can be used to assess current programs and specific needs of a facility. **Tool 1-3** is a sample worksheet of roles, responsibilities, time commitment, and budget for individuals responsible for EMS development. Note that **Tool 11-3** refers to activities that are described later in this EMS Guide.

Tool 1-1: Documents/Information to Have Available for ISO 14001 Gap Analysis

1. General
   - 1.1. ISO 9000 or QS 9000 program manual and procedures
   - 1.2. General facility policies and procedures
   - 1.3. Facility process flow diagrams
   - 1.4. Current facility corrective action plans
     - 1.4.1. From audits
     - 1.4.2. From inspections
     - 1.4.3. From risk assessments
   - 1.5. Facility audit results
   - 1.6. Facility regulatory inspection results
2. Environmental Policy
   - 2.1. Draft or final Environmental Policy or Health, Safety, and Environmental Policy
3. Environmental Aspects
   - 3.1. Lists of prioritized environmental issues/activities
   - 3.2. Procedures for developing lists of prioritized activities
   - 3.3. HAZOP studies
   - 3.4. Incident investigations
4. Legal & Other Requirements
   - 4.1. Environmental compliance files
   - 4.2. Written guide to compliance files
   - 4.3. Title V Air Operating Permit (usually identifies applicable regulatory requirements)
   - 4.4. Mechanism for tracking permits/rules
     - 4.4.1. Subscriptions to regulatory services
     - 4.4.2. Contracts for regulatory updates
     - 4.4.3. Procedures for periodic rule checking
5. Objectives & Targets
   - 5.1. Plant-wide environmental goals or objectives
   - 5.2. Major capital projects
   - 5.3. Procedure for establishing goals and objectives
6. Environmental Management Programs
   - 6.1. Management of change procedure
7. Structure & Responsibility
   - 7.1. Organizational chart
   - 7.2. Job descriptions related to environmental activities
   - 7.3. Mechanisms for making job/task assignments
   - 7.4. List of regular environmental meetings
     - 7.4.1. Within Environmental Department
     - 7.4.2. With top management
8. Training, Awareness & Competence
   - 8.1. Descriptions of existing environmental training at the facility
   - 8.2. Training matrix
   - 8.3. Training tracking records

- 8.4. Craft progression process or competency requirements
- 8.5. Contractor management/training programs

9. Communication
   - 9.1. Existing mechanisms for communicating with employees
     - 9.1.1. Bulletin boards
     - 9.1.2. Newsletters
     - 9.1.3. Staff meetings (safety meetings, "tool-box" meetings, all staff meetings, etc.)
   - 9.2. Procedures for updating/posting information
   - 9.3. Procedures for responding to outside communications (calls, letters, inquiries, etc.)
   - 9.4. Training for top management on media handling
10. EMS Documentation
    - 10.1. Examples of other maintained documents (written plans, Website, procedures)
    - 10.2. Environmental procedures/policy manual or file
11. Document Control
    - 11.1. Document control policy and procedures
    - 11.2. Scope of current document control program
    - 11.3. Record retention policy/procedures
    - 11.4. Procedure format
12. Operational Control
    - 12.1. Preventive maintenance schedules and procedures
    - 12.2. Waste minimization/pollution prevention plans
    - 12.3. Process safety management procedures
    - 12.4. Contractor management/training program
    - 12.5. Standard operating procedures
13. Emergency Preparedness & Response
    - 13.1. Copies of emergency plans
      - 13.1.1. SPCC Plan
      - 13.1.2. Storm Water Pollution Prevention Plan
      - 13.1.3. Incident Response Plan
      - 13.1.4. Evacuation Plan
      - 13.1.5. Other emergency plans
    - 13.2. Schedule and procedures for drills (fire, evacuation, spill, etc.)
14. Monitoring & Measurement
    - 14.1. Examples of current process and environmental measurements
    - 14.2. Calibration procedures and records for monitoring equipment (Preventive Maintenance Program)
    - 14.3. Facility internal inspection/audit procedures and schedules
15. Nonconformance & Corrective & Preventive Action
    - 15.1. Reports on nonconformances from ISO or QS 9000 audits
    - 15.2. Facility corrective action tracking program
    - 15.3. Incident Investigation Procedure

16. EMS Audits
    - 16.1. Description of ISO or QS 9000 audit program
    - 16.2. Example ISO or QS 9000 audit report and corrective action list
    - 16.3. ISO or QS 9000 audit team membership
17. Management Review
    - 17.1. Management directives on environmental activities
        - 17.1.1. Policies
        - 17.1.2. Mandates
        - 17.1.3. Goals
    - 17.2. List of regular management meetings

Tool 1-2: Gap Analysis Tool/Self-Assessment Checklist

Facility Name:_____ Date:_____ Assessor(s):_____

EMS Requirement	Yes	No	N/A	Findings/Remarks	Closed
Module 2: Environmental Policy					
Does your facility have an environmental policy?					
Policy is specific to facility and signed by top management.					
Policy is appropriate to the nature and scale and environmental impacts of its activities, products, or services.					
Policy includes a commitment to continuous improvement in environmental performance and prevention of pollution.					
Policy includes a commitment to sharing information on EMS performance with the community.					
Policy includes a commitment to comply with relevant environmental laws, regulations, and other requirements applicable to the facility.					
Policy provides a framework for setting and reviewing environmental objectives and targets.					
Policy is documented, implemented, and maintained.					
Policy is communicated to all employees.					
Policy is made available to the public through display in reception area or by other means.					
Module 3: Environmental Aspects					
Facility has a procedure to identify the activities, products, or services that can interact with the environment (i.e., environmental aspects) that it can control in order to determine those which have or can have significant impacts.					
Facility has considered on-site contractor activities in its significant aspect determination.					

EMS Requirement	Yes	No	N/A	Findings/Remarks	Closed
Aspects associated with significant environmental impacts are considered when setting facility's environmental objectives.					
Module 4: Legal & Other Requirements					
Facility has a procedure to identify and have access to legal and other requirements.					
Facility maintains access to all current federal, state, and local regulations and ordinances through the computer or by some other means.					
Module 5: Objectives and Targets					
Facility has identified environmental objectives and targets.					
Facility has considered technological options, financial, operational, and business requirements in establishing its objectives and targets.					
Facility has considered legal and other requirements in establishing objectives and targets.					
Facility has considered the views of interested parties in establishing objectives and targets.					
Facility objectives and targets are consistent with environmental policy.					
Module 6: Environmental Management Programs					
Facility has established and maintained programs for achieving objectives and targets.					
New activities, products, or services are reviewed for potential environmental programs plans and controls.					
Facility has identified the means and time-frame for achieving objectives and targets.					
Facility has defined roles and responsibilities for achieving objectives and targets at each relevant function and level within organization.					

EMS Requirement	Yes	No	N/A	Findings/Remarks	Closed
Module 7: Structure & Responsibility					
Facility has defined the roles, responsibilities, and authorities to facilitate implementation of the EMS.					
Facility management has appointed a management representative with defined roles to implement the EMS.					
Facility has a procedure for providing appropriate incentives for personnel to meet EMS requirements.					
Facility environmental management representative reports on the performance of the EMS to top management for review and continuous improvement.					
Module 8: Training, Awareness & Competence					
The organization has performed an environmental training needs analysis.					
Personnel whose work may create a significant impact or is associated with a significant aspect have received appropriate training, education, and/or experience to ensure job competence.					
Facility has a procedure to make its employees aware of the importance of conformance with policy and procedures and the requirements of the EMS.					
Facility has a procedure to make its employees aware of the significant impacts associated with their work, and their roles and responsibilities as they pertain to conformance with the environmental policy and the EMS.					
Facility has a procedure to make its employees aware of the potential consequences of departure from operating procedures.					
Module 9: Communication					
Facility has a procedure for internal communication between the various levels and functions.					

EMS Requirement	Yes	No	N/A	Findings/Remarks	Closed
Facility has a procedure for disseminating and communicating relevant information regarding the EMS, including the facility's environmental performance improvements, throughout the organization.					
Facility has a procedure for receiving, documenting, and responding to relevant communication from external parties.					
Facility has considered a process for external communication relative to significant aspects and recorded decision on how to proceed.					
Module 10: EMS Documentation and Document Control					
Facility has information in paper or electronic form to describe the core elements of the management system and their interactions.					
Facility has information in paper or electronic form to provide directions on how to find appropriate documents.					
Facility has a procedure for controlling all documents required by the EMS.					
Documents and forms are reviewed for adequacy by authorized personnel prior to use or release.					
Relevant documents are accessible for the areas to which they apply.					
Obsolete documents are promptly removed from all points of use or otherwise assured against unintended use.					
Obsolete documents retained for legal or preservation purposes are properly identified.					
Facility has a procedure for defining responsibility concerning the creation and modification of documents.					
Documentation is legible, dated, and readily identifiable; maintained in an orderly manner; and retained for a specified period.					

EMS Requirement	Yes	No	N/A	Findings/Remarks	Closed
Module 11: Operational Control					
Facility has identified operations associated with significant environmental aspects.					
Facility has planned maintenance in order to ensure that they are carried out under specified conditions.					
Operations associated with significant aspects have documented procedures to cover situations where their absence could lead to deviations from the policy, objectives, and/or targets.					
Procedures stipulate operating conditions.					
Facility has a procedure to identify significant aspect of goods and services used by the organization and to communicate relevant procedures and requirements to the suppliers and contractors.					
Facility has a procedure for prevention of pollution and waste minimization to accomplish goal of environmental policy.					
Module 12: Emergency Preparedness & Response					
Methods for preventing, mitigating, and responding to releases that require emergency response have been established and maintained at the facility and involve the appropriate response personnel.					
Roles and responsibilities for communications within the facility and for obtaining outside support services (e.g., police, fire) have been established and maintained at the facility.					
The emergency preparedness and response procedures are reviewed and revised as needed, in particular after an incident occurs.					

EMS Requirement	Yes	No	N/A	Findings/Remarks	Closed
Module 13: Monitoring and Measurement					
Facility has documented procedures for monitoring and measuring key characteristics of operations associated with significant aspects.					
Facility has established metrics to track performance, relevant operational controls, and conformance with objectives and targets.					
Monitoring and measuring equipment is calibrated and maintained as evidenced by appropriate records.					
Facility has documented procedures for periodically evaluating compliance with relevant environmental laws and regulations.					
Facility has a process for planning, scheduling, and implementing internal environmental regulatory compliance assessments, including the identification of necessary resources.					
Managers and/or supervisors are designated to ensure that control and improvement plans are established, implemented, and monitored.					
Module 14: Nonconformance and Corrective and Preventive Action					
Facility has a procedure for defining responsibility and authority for handling and investigating nonconformance.					
Facility has a procedure for taking action to mitigate environmental impacts and for initiating corrective and preventive action.					
Each corrective or preventive action is appropriate in scale to the magnitude of problems and to the environmental impact.					
Facility records and makes changes in documented procedures resulting from corrective and preventive actions.					

EMS Requirement	Yes	No	N/A	Findings/Remarks	Closed
Module 15: Records					
Facility has a procedure to identify, maintain, and dispose of environmental records.					
Each activity responsible for maintaining a record has the responsibility for establishing the method for filing and indexing the records for accessibility.					
Facility record procedure is consistent with corporate record retention procedures.					
Module 16: EMS Audits					
Facility has a program and procedure for planning, scheduling, and implementing periodic internal EMS audits.					
An audit schedule exists for each activity to be audited. Audit frequency is based on priority basis that accounts for previous audit results, the relative importance of the activity, and is not less than once per year for each activity.					
A facility audit team has established a checklist of questions relating to the EMS, which are reviewed and amended as necessary based on audit findings and other factors.					
The facility has a process for audit results to be provided to management for review.					.
Module 17: Management Review					
Management reviews of the EMS are conducted at set intervals.					
The management review addresses the possible need for changes to policy, objectives, process, and/or other elements of the EMS.					

Tool 1-3: Sample Worksheet for Persons Responsible for EMS Development

Roles	Individual(s) Responsible	% of Time Designated	Budget
Environmental Management Representative (EMR) (defined further in *Module 7*) (in small businesses, this could be the owner).			
EMS Coordinator (defined further in *Module 7*).			
EMS Cross Functional Team Participants (defined further in *Module 7*).			
Conducting gap analysis (see discussion in *Module 1*).			
Identifying and determining significance of environmental aspects (see *Module 3*).			
Identifying and determining applicability of legal and other requirements (see *Module 4*).			
Competency-based training (see *Module 8*).			
Operational controls (see *Module 11*).			
Emergency preparedness and response (see *Module 12*).			
Monitoring and measurement of "key characteristics" of operations and activities that can have significant environmental impacts (i.e., the "significant environmental aspects") (see *Module 13*).			
Periodic evaluations of environmental compliance (see *Modules 13* and *14*).			
Handling and investigating nonconformance with the EMS (see *Module 14*).			
Records management (see *Module 15*).			
Internal EMS audits (see *Module 16*).			
Contact Person:	Date Completed:		

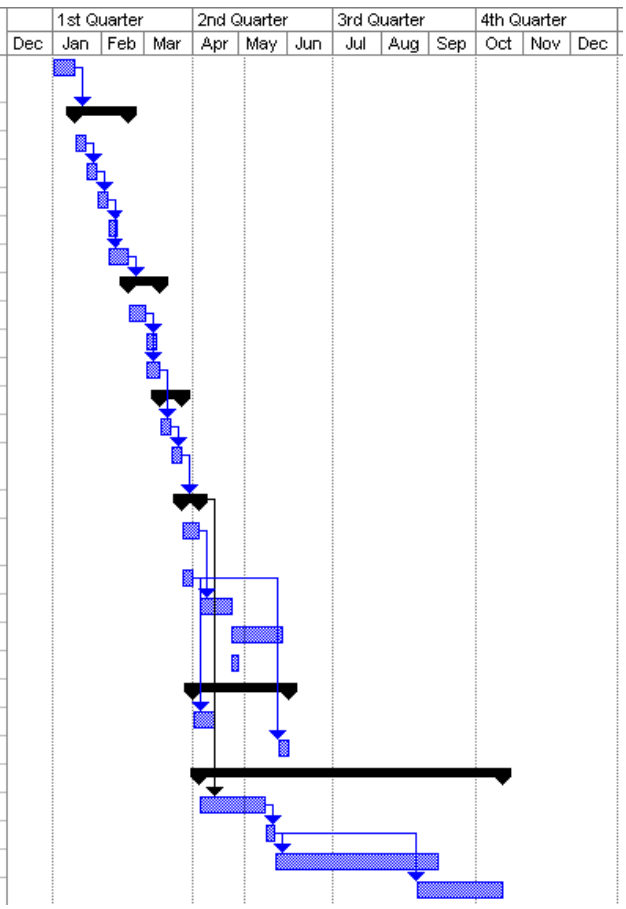
Note:
Most of these blocks will be filled in as development of the EMS progresses. This worksheet will help track progress and serve to remind the Cross Functional Team and management of necessary assignments.

Examples

Example 1-1 shows a typical EMS implementation schedule. Plan to spend 9-12 months, on average, developing your system.

Example 1-1: Example Schedule for EMS Implementation

ID	Task Name
1	Making the Commitment: Creating a Policy Statement and Determining the Scope
2	**Cross Functional Team**
3	Form the team
4	ISO 14001 Implementation Training
5	Conduct GAP Analysis/Self Assessment
6	Develop schedule
7	Define Role & Responsibilities
8	**Aspects & Significant Aspects**
9	Identify Aspects
10	Legal & Other Requirements
11	Determine Significant Aspects
12	**Objectives & Targets**
13	Develop Objectives & Targets
14	Submit Aspects, O&T, and Policy for Mgmt Review
15	**EMPs**
16	Identify EMP tasks, responsibilities, & completion dates
17	Submit EMPs for management review
18	**Develop operational controls**
19	**Develop monitoring & measurement procedures**
20	**Determine roles, responsibilities, & authorities**
21	**Training Programs**
22	Develop training needs
23	Revise training needs & program procedures
24	**Internal Auditing**
25	Develop procedure, checklist, & schedule
26	Internal Audit Training
27	Conduct audits
28	Corrective & preventive actions



MODULE 2: ENVIRONMENTAL POLICY

Guidance and Tools

Once your facility has its EMS team (the EMR, EMS Coordinator, and CFT) trained and in place, the next step is to create a working draft of your facility's environmental policy. As your EMS team moves forward, the policy should serve as the foundation for your EMS and provide a unifying vision of environmental principles that will guide the actions of employees and management. This policy statement should provide the framework for setting environmental objectives and targets.

Your EMS should be based upon a documented and clearly communicated policy. In order to meet the requirements of ISO 14001, your policy must include the following elements:

- Commitment to continued improvement and pollution prevention;
- Commitment to comply with environmental laws and regulations and other requirements to which your organization subscribes; and
- Framework for setting and reviewing environmental objectives and targets.

In addition, your environmental policy must be:

- Appropriate in nature, scale, and environmental impacts of your facility's activities, products, or services;
- Documented, maintained, and communicated to all employees; and
- Available to the public.

The EMS policy should set out the facility's overall commitment to a cleaner environment. Examples of commitments that should be stated in your EMS policy are those presented by EPA's National Environmental Performance Track program:

- Compliance with legal requirements and any voluntary commitments;
- Pollution prevention;
- Continuous improvement in environmental performance, including areas not subject to regulations; and
- Sharing information about environmental performance and the operation of your EMS with the community.

Hints:

- **Apply existing company policies**, written or implied. If your current policy is implied, such as a dedication to meet environmental laws, document the concepts in writing.

- Keep your policy simple and understandable, yet explicit. **Be direct** – the wording in your policy should avoid general statements such as "We are committed to excellence and leadership in protecting the environment" unless you can demonstrate how such a commitment is being met.

- The environmental policy can be a stand-alone document or it can be **integrated** with your health & safety, quality, or other organizational policies.

- Consider involving a **wide range of people** from your organization to develop your policy. This approach should increase commitment and ownership.

- Make sure that your employees **understand** the policy. Options for communicating your policy internally include posting it at the shop floor communication center, in breakroom and bathrooms, using paycheck stuffers, incorporating the policy into training classes and materials, and referring to the policy at staff or all-hands meetings. **Test awareness** and understanding before your audits by asking employees what the policy means to them and how it affects their work.

- The policy also should be communicated **externally**. You can meet this requirement by posting a copy of your policy in the reception area of your plant. More aggressive strategies include: placing the policy on business cards, in newspaper advertisements, and in annual reports, among other options. How you communicate your policy should be factored into your overall strategy for external communication (see later discussion in *Module 9* regarding Communication).

- Consider how you would **demonstrate** that you are living by the commitments laid out in the policy. This is a good test of whether or not the policy is a "living document."

Tool 2-1 is a generalized template for an environmental policy that could be adapted to your facility. Remember: Top management must commit to the environmental policy statement, with the company president or operations manager signing and dating it.

Tool 2-1: Generalized Environmental Policy Template

[YOUR FACILITY'S NAME] ENVIRONMENTAL POLICY

[Facility Name] is committed to managing environmental matters as an integral part of our business planning and decisions. Manufacturing and environmental protection must continue to be compatible goals. To obtain these goals, we will adhere to the following principles:

COMPLIANCE
We will comply with applicable laws and regulations and will implement programs and procedures to ensure compliance with legal requirements and voluntary commitments. **[Facility Name]** shall promote a workplace in which all employees are properly trained to comply with environmental requirements and procedures, to meet environmental program goals, and to take personal responsibility for implementation of the program.

POLLUTION PREVENTION AND RESOURCE MANAGEMENT
We are committed to pollution prevention and the continual improvement of our environmental performance. We commit to eliminate, or reduce to the maximum practical extent, the release of contaminants into the environment, first through pollution prevention (material substitution and source reduction), then recycling, and finally through treatment and control technologies.

We will employ management systems and procedures designed to prevent activities and/or conditions that pose a threat to human health, safety, or the environment, and we will work to minimize our impact on the environment.

COMMUNICATION
We will communicate our commitment to environmental quality and to our company's environmental performance to our employees, vendors, customers, and external stakeholders.

CONTINUOUS IMPROVEMENT
We will measure our progress as best we can and report on our efforts on an annual basis. We will continuously seek opportunities to periodically review and demonstrate continuous improvement in the facility's environmental performance, including areas not subject to regulations.

Management at all levels of **[Facility Name]** is responsible for ensuring that this policy is communicated and adhered to by all employees and subcontractors, and that it is made available to interested members of the public.

{Signature} President _____ Date _____

Examples

Examples 2-1 through **2-3** are examples of foundry policies that conform to the criteria cited in *Module 2*.

Example 2-1: Example Foundry Environmental Policy

Foundry Corporation1
Environmental Management System Policy

Foundry Corporation1 believes the health and safety of its employees and the protection of the natural environment are critical concerns in the operation of its business.

Therefore, it is the policy of Foundry Corporation1 to:

- Actively pursue process innovation in order to reduce and eliminate waste from its operations and prevent environmental pollution.
- Routinely review and assess its operations for the purpose of making continual improvements in areas of health, safety and environmental concern, beyond those legally required, where such improvements provide significant benefits.
- Comply with all applicable laws, regulations and standards in its product development, manufacturing, marketing and distribution activities.

Using its established EMS policy, this facility will develop annual safety and environmental goals, and implement action plans in accordance with corporate performance standards to ensure that its operations comply with this policy.

Foundry Corporation1 will provide the support and resources necessary, as its commitment to these goals and objectives.

Furthermore Foundry Corporation1 is committed to continual improvement in the environmental performance of the company and shall to the best of its ability:

- Promote pollution prevention and take steps to conserve resources through energy conservation and recycling.
- Implement, maintain, and continuously improve an effective environmental management system.
- Regularly communicate our environmental performance with all employees and neighbors.

All employees have been informed of this policy and are expected to incorporate sound health, safety and environmental practices in the conduct of their jobs.

{Signature} President _____ Date _____

Example 2-2: Example Foundry Environmental Policy

Foundry Corporation2
Environmental Policy Statement

Foundry Corporation2 is committed to achieving the highest world wide environmental standard. We are concerned for the well being of our employees and our environment. This policy is designed to address the company's environmental concerns and then insure a continuous commitment to environmental awareness and excellence.

It is the policy of Foundry Corporation2 to:

- Comply with all applicable federal, state and local environmental regulations while also complying with other voluntary initiatives to reduce our Environmental Impacts.
- Pursue waste minimization and pollution prevention strategies via the implementing and tracking of targets and objectives that we evaluate quarterly.
- Strive to continually improve our Environmental Management System to become more efficient and environmentally conscious in our operations.
- Routinely train our employees and communicate with our neighbors the applicable aspects of the company's Environmental Management System.

In following our Environmental Policy, Foundry Corporation2 will become a safer and more environmentally sound company for our employees, customers, suppliers and our community.

_____ _____

President Facility Manager

Example 2-3: Example Foundry Environmental Policy

Environmental Policy of
Foundry Corporation3

Foundry Corporation3 is committed to continually striving to protect its employees and the environment by being responsive and responsible. In achieving that goal we are committed to the prevention of pollution and to the continuing effort of improving the processes and procedures of our facility to be as compatible with our surrounding environment as possible.

To that end, Foundry Corporation3 sets out the following Environmental Policy objectives:

1. To comply with any and all applicable laws, regulations and other applicable voluntary or non-regulated requirements to ensure that our organization is a diligent community partner;
2. To establish procedures by which we can continually set and review our environmental objectives and goals to evaluate our compliance and conformance;
3. To develop processes to document, implement and maintain our efforts associated with improving our environmental performance;
4. To create a procedure for effectively communicating this information to the employees of Foundry Corporation3; and
5. To make information about our environmental management system available to the public.

In following this policy, Foundry Corporation3 will become a safer and more environmentally sound company for our employees, customers, suppliers and our community.

_____

President

MODULE 3: ENVIRONMENTAL ASPECTS

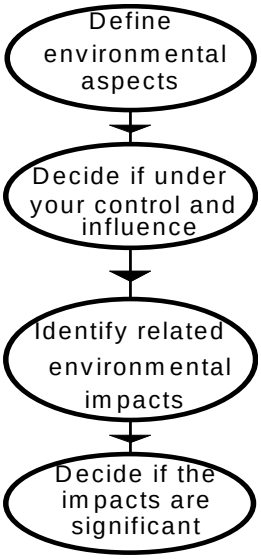
Guidance and Tools

To plan for and control its environmental impacts, an organization must know what these impacts are. But knowing **what** the impacts are is only part of the challenge – you also should know **where these impacts come from** and **which impacts are significant**. Stated another way, *how does your organization (i.e., your products, services, and activities) interact with the environment?*

> ***Environmental aspect (EA)*:** An element of a company's activities, products, or services that can or does interact with the environment (create an environmental impact).
>
> ***Environmental impact*:** Any change to the environment, whether adverse or beneficial, resulting from a company's activities, products, or services.

You will need to identify environmental **aspects** that the organization:

- Can control, or
- Over which it can have an influence.



Your organization **is not expected** to manage issues outside its sphere of influence or control. For example, while your organization could decide to exert some management control or influence over the use phase of the product, it would also be understandable to claim that the use phase is not under your control or influence. Similarly, if your organization manufactures a product that is subsequently incorporated into another product (for example, a bumper that becomes part of an automobile), your organization does not control the environmental aspects of that "finished" product (the automobile). Another example might be noise generated by train traffic that traverses your property – it could be reasonable to assert that this is out of your control. Thus, your focus should be on the environmental aspects of **your** products or services.

The relationship between aspects and impacts is often one of **cause and effect**. The term "aspects" can be either **positive** (such as making a product out of recycled materials) or **negative** (such as discharging toxic materials to a stream).

Once you have identified the environmental aspects of your products, activities, and services, you should determine which aspects could have significant **impacts** on the environment. For example, emissions of fugitive dust and other particulate matter (an aspect) may lead to pulmonary impairment in humans (an impact). Positive aspects, such as use of recycled paper or other materials, have positive impacts – in this case, conservation of natural resources.

Once you have identified the environmental aspects associated with your facility's products, activities, and services, you will determine what subset of these are likely to have significant impacts. The determination, resulting in your list of significant environmental aspects (SEAs), will be one of the most crucial steps in EMS planning. It can be one of the most challenging as well as one of the most rewarding. Decisions you make in this step will affect many other system elements, such as setting objectives and targets, establishing operational controls, and defining monitoring needs, as discussed later in this EMS Guide. Careful planning of this activity will pay dividends later.

Start by assembling your Cross Functional Team (CFT) and reviewing Section 4.3.1 of the ISO 14001 Standard and the associated guidance in Annex A of the Standard. This section of the standard requires that an organization identify the environmental aspects of their activities, products, and services.

- To identify your environmental aspects you will need a detailed understanding of all the processes and support activities that allow you to generate products and services. To assist in this process, assemble the following materials:

    - Process flow diagrams;
    - Plant diagrams;
    - Environmental cost data (waste disposal, permit fees, energy and water use, consultant fees, training, etc.);
    - Material Safety Data Sheets (MSDSs);
    - Incident reports (spills, complaints, fires, etc.); and
    - List of legal and other requirements (see *Module 4*).

- Discuss with the team members the definition of aspects and impacts, and develop a set of impacts to reference - this will help make your list more consistent. For impacts, consider (actual or potential):

    - Waste (sand, refractories, slag, dust, etc.);
    - Natural resource use (water, chemicals, landfill space, etc.);
    - Energy use;
    - Air emissions;
    - Impact to surface water or sewer system;
    - Impact to soil and groundwater (spills/releases);
    - Noise;
    - Odors; and
    - Others (light, radiation, vibration, etc.).

- Determine the categories of activities at your facility (e.g., receiving, melting, core making, mold making, pouring, grinding, and shipping).

- Pick one category and sketch a simple flow chart, noting inputs (chemicals, materials, energy, natural resources, etc.) and outputs (product, emissions, wastes, etc.). Look at the various activities (or aspects) associated with the inputs and the impacts (actual or potential) associated with the outputs. Record the identified aspects and impacts (see **Tool 3-2**).

- Remember to look at **services** as well as products. While the need to examine on-site operations might be obvious, you also should consider the potential impacts of what you might do **"off-site"** (such as servicing equipment at customer sites). Similarly, the environmental aspects of the products, vendors, and contractors **you use** may be less obvious, but should still be considered. You will also want to consider **normal operating conditions, shut-down** and **start-up situations,** as well as **reasonably foreseeable emergency situations.**

- Section 4.3.1 of the ISO 14001 Standard requires that organizations consider their significant impacts when setting objectives and targets. But which impacts are significant? ISO 14001 does not define the word "significant". Instead, each organization must determine which of its impacts are significant. Your team, therefore, will define the **criteria** that will be used to determine significance.

    - One criterion may be whether or not the associated aspect is subject to environmental regulation or the subject of already established company policy.
    - Another criterion might be tied to the views of interested parties. One of the commitments of your EMS policy must be good communication with external stakeholders. Thus, the aspects that they consider important, perhaps have lodged complaints about, could be significant in your EMS.
    - Other criteria often include the magnitude, frequency, and duration of the impact.

- Some organizations use a numerical scoring system (see **Example 3-3**), others simply use a criteria based approach.

- You may choose to use the **worksheets** and **forms** in the tools provided in this module to capture some of your ideas. Using these worksheets will give you a "jump start" on implementing this EMS element.

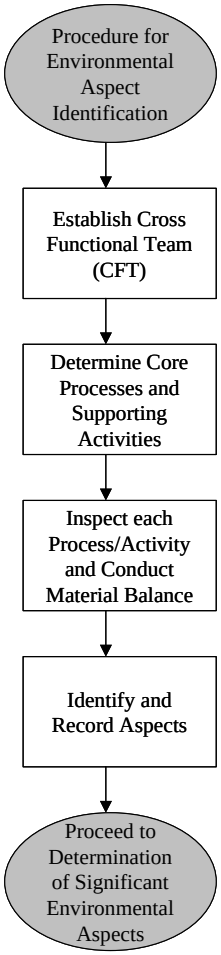
- Once you have identified environmental aspects, impacts, and significant environmental aspects you will use this information as a basis for setting your objectives and targets, which will be discussed in *Module 5*. You must effectively manage and control all aspects that are significant as a result of being subject to environmental regulations. **This does not mean that you need to improve your performance on all of your significant aspects at once**. There may be good reasons (such as cost, availability of technology, or scientific uncertainty) for making environmental improvements regarding some significant aspects now while deferring action on others.

Tool 3-1: Sample Procedure for Identification of Environmental Aspects and Determination of Significant Aspects

1.0 Purpose

This procedure defines the method for the identification of environmental aspects of the **[Your Facility's Name]** operations and determination of significance for aspects that have actual or potential significant impacts on the environment.

2.0 Procedure for Environmental Aspect Identification



3.0 Responsibilities of the CFT

The facility Cross Functional Team (CFT) led by the Environmental Management Representative (EMR) or his designee is responsible for completing the form for each core process and supporting activity within a facility. If possible, members of the CFT must conduct a physical inspection when completing this form. The completed form is a material balance of a process or activity and is used to identify environmental aspects.

At a minimum, the CFT will review and revise the completed forms, by means of physical inspection, as necessary at issuance, annually, prior to and immediately following implementation of new or modified processes/activities.

All environmental aspects are evaluated for significance as defined below in the **Procedure for Determination of Significant Environmental Aspects**.

The following procedure is used to fill out the Aspect Identification portion of **Tool 3-2**, **Sample Form for Identification and Significance Determination of Environmental Aspects.**

The material balance consists of identifying all raw materials, chemicals, and utilities used as inputs along with their relative usage rates, and all output as product and by-products produced.

The latter is all wastes produced, all recycled materials, water discharges, and air emissions known for the process(es), and any available rates of production.

For inputs and outputs, identify the category of aspects, the mode of operation under which the aspect is conducted (normal, startup, shutdown, or emergency), and the quantity or volume used per month.

Inputs

- Supplies: Enter the major, non-chemical supplies used in the process.
- Chemicals: Enter any chemical materials used in the process.
- Energy Use: Enter energy type and usage. (Levels are relative to the facility.)
- Water Use: Enter water type (e.g., city, well, storm, process, chilled) and usage. (Levels are relative to the facility.)
- Other Inputs: Enter inputs that are not covered clearly in other categories.

Outputs

- Products: List all products produced by the process specifically produced for sale. Recyclable and Chemical By-Product (e.g., foundry sand) outputs are entered in the waste section.
- Air Emissions: List all air emissions whether they are drawn directly through a stack or are discharged into the room and escape as fugitive emissions.
- Noise/Odor/Radiation: Include noise and odor as an air emission if potentially noticeable outside the facility and list any potential radiation emitted from the facility.
- Water Discharges: Enter all wastewater streams that discharge directly to storm or sanitary sewer systems or surface waters. Containerized wastewater should be included in the waste section.
- Solid / Residual Wastes: Wastes are any materials intended to be discarded or disposed of, whether regulated or not, and include liquids, solids, and gases. Also include recycled materials, returnable containers, and chemical by-products under this category.
- Storm Water Discharges: List all storm water discharges from all process areas.
- Spills: Enter all potential spills that might occur in all process areas.
- Other Outputs: Enter outputs that are not covered clearly in other categories.

4.0 Procedure for Determination of Significant Environmental Aspects

Where appropriate, individual aspects can be grouped. (For example, if consumption of energy is listed as an environmental aspect in several areas, the CFT could choose to group these listings such that consumption of energy appears just once on a facility-wide form.)

Using the Significance Determination portion of **Tool 3-2**, the CFT or a subset thereof shall evaluate, using its best judgment, each identified aspect and determine whether or not it is significant. The environmental aspects of **[Your Facility's Name]** may be considered by the CFT to be "significant" where the aspect has an impact on the environment and meets one or more of the following criteria:

1. Subject to specifically relevant legislation, regulation, and/or permit requirements that address significant impacts to the environment. This will likely include aspects associated with processes and activities if (1) environmental regulations specify controls and conditions, (2) information must be provided to the authorities, and/or (3) there are or may be periodic inspections or enforcements by the authorities. Potential aspects that are subject to environmental regulations in the event of incidents will be recognized as significant when such as event occurs.
2. Subject to or associated with environmentally-related company goals, directives, policies or subject to or associated with voluntary covenants to which the company had committed.
3. Subject to or associated with community concerns, such as those previously expressed in the form of complaints or critical inquiry. This criterion only shall be reviewed when an aspect is not significant because criteria 1 or 2 apply.
4. Based on technical and business conditions, has a high potential for pollution prevention or resource-use reduction. This criterion only shall be reviewed when an aspect is not significant because criteria 1 or 2 apply.
5. Associated with potential release to the environment from the high environmental loading due to one or more of the following:
    a. Toxicity (compositional characterization of materials and wastes)
    b. Amounts (volumes and masses or release)
    c. Amounts (consumption of renewable and non-renewable resources)
    d. Frequency of episodes
    e. Severity of actual or potential impacts

This criterion only shall be reviewed when an aspect is not significant because criteria 1 or 2 apply.

5.0 Frequency

This procedure is to be repeated at least annually, if not more frequently. More frequent updates apply especially to new project or processes that effect the list of the facility's significant aspects.

6.0 Records

Tool 3-2 is maintained by the Environmental Management Representative (EMR) or his designee.

Tool 3-2: Sample Form for Identification and Significance Determination of Environmental Aspects

Person Completing Form: _____ Area/Process: _____ Date: _____

ASPECT IDENTIFICATION			SIGNIFICANCE DETERMINATION							OBJECTIVES AND TARGETS*	
Category/ Aspect	**Mode** SD=shutdown, ST=startup, NM=normal, E = emergency	**Quantity or Volume (e.g., lbs/month)**	**Legal Requirements**	**Company Goal or Policy**	**Community Concern**	**Potential Release to the Environment**	**Pollution Prevention Potential**	**I or S**	**Rationale for Significance (S) or Insignificance (I)**	**Objective & Type** C = control or maintain S = study or investigate I = improve	**Target**
Supplies:											
Chemicals:											
Energy Use:											
Water Use:											
Products:											
Air Emissions:											
Noise/Odor/Radiation:											
Water Discharges:											

ASPECT IDENTIFICATION			SIGNIFICANCE DETERMINATION							OBJECTIVES AND TARGETS*	
Category/ Aspect	**Mode** SD=shutdown, ST=startup, NM=normal, E = emergency	**Quantity or Volume (e.g., lbs/month)**	**Legal Requirements**	**Company Goal or Policy**	**Community Concern**	**Potential Release to the Environment**	**Pollution Prevention Potential**	**I or S**	**Rationale for Significance (S) or Insignificance (I)**	**Objective & Type** C = control or maintain S = study or investigate I = improve	**Target**
Solid/Residual Wastes:											
Storm Water Discharges:											
Spills:											
Other Inputs and Outputs:											

Notes:

- **This part will be discussed in *Module 5, Objectives and Targets*. A filled-in version of this form can be found in Example 3-3.**

Examples

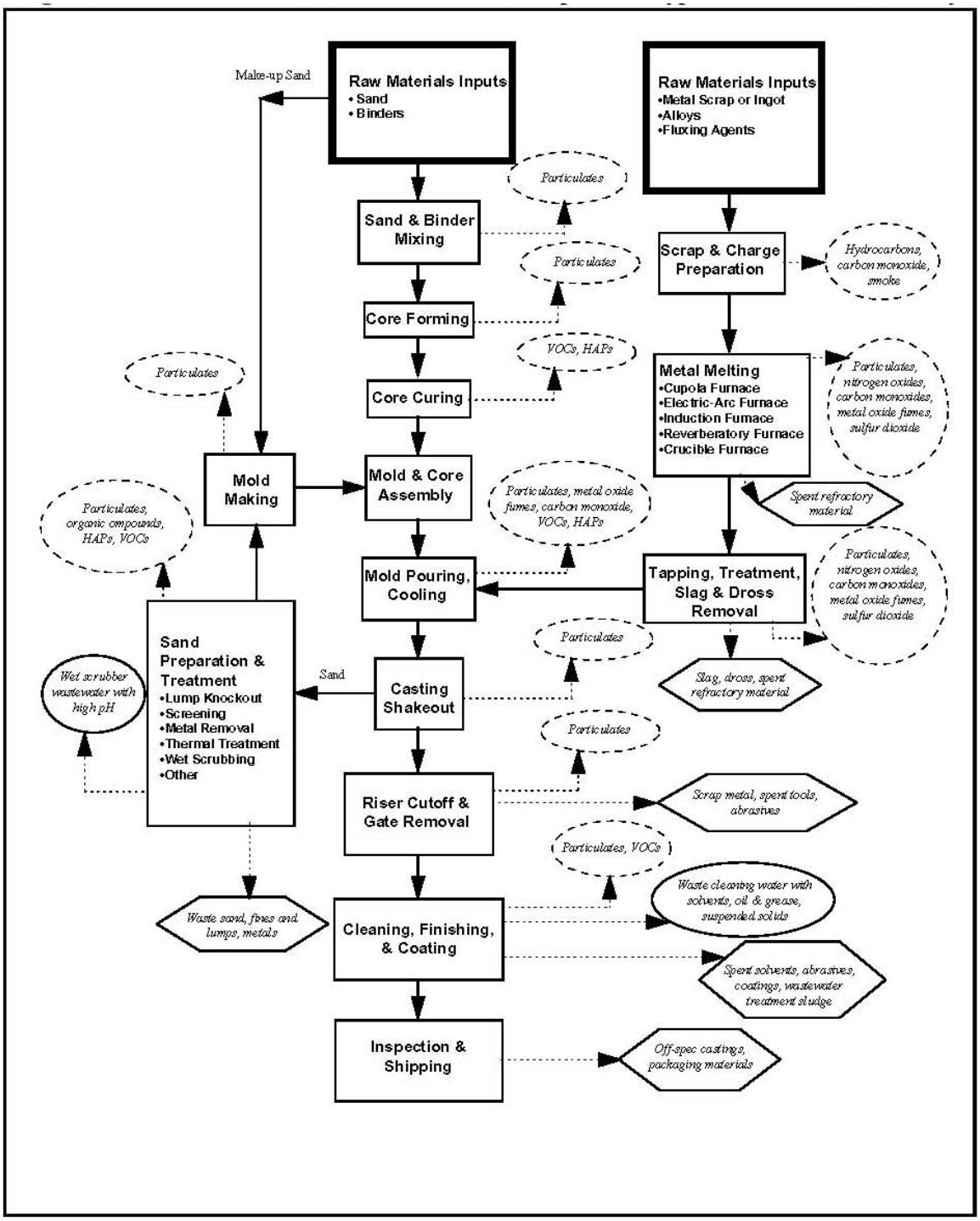
The following examples provide step-by-step guidance on identifying environmental aspects and determining significance of environmental aspects in the foundry industry.

- **Example 3-1** provides examples of links between aspects and impacts.
- **Example 3-2** provides a process flow diagram for a typical green sand foundry.
- **Example 3-3** is an example of a numerical scoring system approach used by a foundry.

Example 3-1: The Link Between Aspects and Impacts

Aspects	Potential Impacts
Emissions of fugitive dust and other particulate matter	Pulmonary impairment in humans
Discharges to sanitary sewer	Upsets and disruptions at local Publicly-Owned Treatment Works (POTW)
Spills and leaks	Soil and groundwater contamination
Electricity use	Air pollution, global warming
Use of recycled paper	Conservation of natural resources

Example 3-2: Process Flow Diagram for a Typical Green Sand Foundry



Source: Adapted from Kotzin, Air Pollution Engineering Manual: Steel Foundries, 1992.

Example 3-3: A Foundry's Numerical Scoring System Approach

ISO14001 ASPECTS, IMPACTS, AND SIGNIFICANCE REGISTER

1 - ASPECT IDENTIFICATION					2 - SIGNIFICANCE DETERMINATION						
CATEGORY	ASPECTS / SOURCE	ANNUAL USAGE	SOURCE	POSSIBLE IMPACT	LEGAL REQUIREMENTS	COMPANY GOALS/POLICY	PUBLIC CONCERNS	POTENTIAL RELEASE TO THE ENVIRONMENT	POLLUTION PREVENTION POTENTIAL	FREQUENCY PROBABILITY	RANKING NUMBER
INPUTS:											
SUPPLIES:	IRON SCRAP		MELT	USE OF RECYCLED MATERIAL	1	1	1	1	0	1	5.0
	HARDWARE		ASSEMBLY	USE OF NATURAL RESOURCE	0	1	0	1	0	1	3.0
	CARDBOARD		CARTONING	USE OF NATURAL RESOURCE	0	2	0	1	0	2	5.0
	SHRINK WRAP		SHIPPING	USE OF NATURAL RESOURCE	0	2	0	1	0	2	5.0
	BANDING, PLASTIC		SHIPPING	USE OF NATURAL RESOURCE	0	1	0	1	0	2	4.0
	PALLETS		CARTONING	USE OF NATURAL RESOURCE	0	2	0	1	0	2	5.0
	SAND		MOLDING/CORE MAKING	USE OF NATURAL RESOURCE	0	2	1	1	0	2	6.0
	PRE-MIX		MOLDING	USE OF NATURAL RESOURCE	0	1	0	1	0	2	4.0
	GRINDING WHEELS		FINISHING	USE OF NATURAL RESOURCE	0	1	0	1	0	2	4.0
	STEEL SHOT		FINISHING	USE OF NATURAL RESOURCE	0	1	0	1	0	2	4.0
CHEMICALS:	FLUX		MELT	SOIL & GROUNDWATER CONTAMINATION	1	0	0	1	1	1	4.0
	PARTING AGENT		MOLDING	SOIL & GROUNDWATER CONTAMINATION	3	1	1	2	1	2	10.0
	BINDER (PART I)		MOLDING	SOIL & GROUNDWATER CONTAMINATION	1	1	1	1	0	1	5.0
	BINDER (PART II)		MOLDING	SOIL & GROUNDWATER CONTAMINATION	1	1	1	1	0	1	5.0
ENERGY USE:	NATURAL GAS		FURNACES	USE OF NATURAL RESOURCE	1	3	0	1	1	3	9.0
	ELECTRICITY		PLANT-WIDE USAGE	AIR POLLUTION, GLOBAL WARMING	1	3	0	1	1	3	9.0
	PROPANE		LIFT TRUCKS	USE OF NATURAL RESOURCE	1	1	0	1	2	2	7.0
	GASOLINE		LIFT TRUCKS	SOIL & GROUNDWATER CONTAMINATION	1	0	0	1	1	2	5.0
WATER USE:	CITY WELL		USAGE	USE OF NATURAL RESOURCE	1	3	0	2	1	1	8.0

MODULE 4: LEGAL AND OTHER REQUIREMENTS

Guidance and Tools

Setting the Legal Framework for Your EMS

Section 5.4.3 of ISO 14001 requires organizations to define and have access to their legal and other requirements. Compliance with these legal requirements is one of the main pillars upon which your environmental policy should be based. The potential costs of non-compliance (possible damage to the environment, revenue loss and impact on public image, for example) can be very high.

An effective EMS will build on what you already have and should include processes to:

- Identify and communicate applicable legal and other requirements; and
- Ensure that these requirements are factored into the organization's management efforts.

New or revised legal requirements might require modification of your environmental objectives or other EMS elements. By **anticipating new requirements** and making changes to your operations, you might avoid some future compliance obligations and their costs.

Getting Started

Your EMS should include a procedure for **identifying, having access to, and analyzing** applicable legal and other requirements. "Other requirements" might include industry codes of practice or similar requirements to which your organization might subscribe.

Legal requirements include, but are not limited to:

- Federal requirements;
- State and local requirements; and
- Permit conditions.

Other requirements might include:

- Customer (such as maintaining an ISO 14001 system), packaging, labeling, etc.;
- Parent company or corporate requirements;
- Industry or trade group codes of practice;
- EMS requirement (e.g., reviewing the legal and other requirements list annually); and
- Neighborhood or community associations.

Identifying applicable regulations, interpreting them, and determining their impacts on your operations can be a time-consuming task. Fortunately, there are many sources for obtaining information about applicable laws or regulations. These sources include:

- Commercial services (with updates offered on-line, on CD-ROM, or in paper form);
- Regulatory agencies (federal, state and local);
- American Foundry Society (www.afsinc.org);
- The Internet (see EPA Website at www.epa.gov);
- Consultants and attorneys; and
- Customers, vendors and other companies.

Once the applicable environmental requirements have been identified and adopted into the appropriate operations, **communicate** these requirements (and plans for complying with them) to employees, on-site contractors and others, as needed. Communicating "other applicable requirements" (as well as their influence on the organization) is an important but often overlooked step. Keep in mind that different people may have different information needs.

As with many EMS elements, this is **not a "one time" activity**. Because legal and other requirements change over time, your process should ensure that you are working with up-to-date information. The list of legal and other requirements for your facility should be reviewed and updated:

- When changes in the plant affect legal status;
- When the regulations change;
- When permits are renewed or modified;
- When customer requirements change (packaging, materials, reporting, etc.); and
- Annually.

To begin the process of identifying applicable regulations and help determine their impacts on your operations, it will be helpful to keep a list of answers to the questions in **Tool 4-1** for current use and future reference.

Tool 4-1: Legal and Other Requirements Worksheet

Questions	Your Answers
Do we have an **existing process** for identifying applicable legal and other requirements? If yes, does that process need to be revised? In what way?	
Who needs to be involved in this process within our organization? What should their responsibilities be?	
What **sources of information** do we use to identify applicable legal and other requirements? Are these sources adequate and effective? How **often do we review** these sources for possible changes?	
How do we ensure that we have **access** to legal and other requirements? (List any methods used, such as on-site library, use of Websites, commercial services, etc.)	
How do we **communicate information** on legal and other requirements to people within the organization who need such information?	
Who is **responsible** for analyzing new or modified legal requirements to determine how we might be affected?	
How will we keep information on legal and other requirements **up-to-date**?	
Our next step on legal and other requirements is to …	

Tool 4-2 describes a variety of commercial and non-commercial sources of information on federal and state environmental laws and regulations. This list is not intended to be comprehensive. Appearance on this list should not be construed as an endorsement by EPA of any commercial products listed here.

Tool 4-2: Information Resources for Legal Requirements

Source	Description
USEPA Web Site	Provides a variety of information of environmental laws and regulations as well as tools and compliance guidance. (http://www.epa.gov)
USEPA Small Business Ombudsman (1-800-368-5888)	Regulatory explanations and guidance, research, case studies, contacts for additional information.
Small Business Assistance Programs (various states) and Other State Agencies	Guidance on regulations and compliance issues. Initially focused on Clean Air Act requirements, but expanding into other environmental media.
US Small Business Administration	Various services available to small businesses in the US.
US Government Printing Office (202-512-1800)	Federal Register published daily with all federal proposed and final rules. (Also available on line via *GPO Access.)*
Trade and Professional Associations American Foundry Society (AFS) (847) 824-0181	Trade associations provide a variety of services related to environmental laws and regulations, including regulatory updates and training. Regulatory explanations and guidance, research, contacts for additional information. (http://www.afsinc.org)
Counterpoint Publishing (1-800-998-4515)	CD-ROM and Internet dial-up access to legal / regulatory information for federal government and all 50 states, updated daily.
Bureau of National Affairs (1-800-372-1033)	Information on EHS laws, regulations and activities at international, national, and state level. Paper and electronic access available.
Thompson Publishing Group (1-800-677-3789)	Manuals on a variety of federal and state environmental programs with monthly updates and newsletters.
Business & Legal Reports, Inc. (1-800-727-5257)	Access to federal and state regulations with monthly updates available on CD-ROM.
Aspen Law and Business (1-800-638-8437)	Publishes compliance manuals with regular update service for RCRA and Clean Air Act.

The following **Tool 4-3** is a sample procedure for identification of legal and other requirements that incorporates the principles presented in the guidance. This tool references **Tool 4-4**, which provides a sample form for foundry industry operations. **Tool 4-5** provides another sample worksheet for identifying legal requirements by environmental media/program.

Tool 4-3: Sample Procedure for Identification of Legal and Other Requirements

1.0 Purpose

[Your Facility's Name] is committed to complying with all applicable environmental regulations. This procedure describes how **[Your Facility's Name]** identifies applicable regulations and other requirements.

2.0 Procedure

2.1 The Environmental Management Representative (EMR) is responsible for tracking applicable environmental laws and regulations and evaluating their potential impact on the facility's operations. He or she employs several techniques to track, identify, and evaluate applicable laws and regulations. These techniques include commercial databases, information from the trade association, direct communication with national and state regulatory agencies, and periodic refresher training on environmental laws.

2.2 As necessary, the EMR may call upon off-site resources such as consultants or attorneys.

2.3 The EMR compiles and maintains updated copies of applicable environmental laws and regulations and other requirements.

2.4 The EMR, working with the EMS Coordinator and Cross Functional Team (CFT), correlates these regulations to the business activities and environmental aspects associated with them using **Tool 4-4**.

3.0 Frequency

Periodic: Depends on information source.

4.0 Records

Tool 4-4 is maintained by the EMS Coordinator. The EMR maintains access to the applicable regulations.

Tool 4-4: Foundry Industry Operations: Sample Form for Environmental and Other Legal Requirements

Identification			Production Process					Facility Support							
Category/ Aspect	Legal and Other Requirements	Description	Melting	Core Making	Molding	Pouring, Cooling, and Shakeout	Grinding and Finishing	Purchase of Raw Material	Facility Plant Maintenance	Tank Farm and Fuel Transfer	Chemical and Waste Storage	Administration	Generation of Power, Compressed Air, Steam, and Process Water	Medical Facilities for Employees	All*

See **Example 4-1** on how to fill out this form.

Tool 4-5: Sample Worksheet for Identifying Legal Requirements

MEDIA/ PROGRAM	PLANS/ PERMITS	SOURCES/ DISCHARGES	KNOWLEDGE OF REGULATIONS	MGMT. PROCEDURES
CAA				
SDWA UIC				
FIFRA				
NPDES				
Wetlands				
RCRA Generator Status:				
TSCA/PCBs				
UST				

Examples

Example 4-1 provides a comprehensive list of environmental laws applicable to the foundry industry.

Example 4-1: Regulatory Checklist for Foundry Facilities

Identification			Production Process					Facility Support							
Category	Legal and Other Requirements	Description	Melting	Core Making	Molding	Pouring, Cooling and Shakeout	Grinding and Finishing	Purchase of Raw Material	Facility Plant Maintenance	Tank Farm and Fuel Transfer	Chemical and Waste Storage	Administration	Generation of Power, Compressed Air, Steam, and Process Water	Medical Facilities for Employees	All*
Air Emissions	40 CFR Part 50	NAAQS national Primary and Secondary Air Quality Standards	X	X	X	X	X								
Air Emissions	40 CFR Part 51	Emission of Hazardous Air Pollutants	X	X	X	X	X								
Air Emissions	40 CFR Part 52	Emission of Hazardous Air Pollutants	X	X	X	X	X								
Air Emissions	40 CFR Part 60 40 CFR 60.42c and 60.43c (Boiler emission standards for sulfur dioxide and PM)	Verification of VOC Emissions	X	X	X	X									
Air Emissions	40 CFR Part 63	National Emissions Standards for Hazardous Air Pollutants for Source Categories	X	X	X	X				X	X		X		

Example 4-1: Regulatory Checklist for Foundry Facilities

Identification			Production Process					Facility Support							
Category	Legal and Other Requirements	Description	Melting	Core Making	Molding	Pouring, Cooling and Shakeout	Grinding and Finishing	Purchase of Raw Material	Facility Plant Maintenance	Tank Farm and Fuel Transfer	Chemical and Waste Storage	Administration	Generation of Power, Compressed Air, Steam, and Process Water	Medical Facilities for Employees	All*
Air Emissions	40 CFR Part 68	Chemical Accident Prevention Provisions											X		
Air Emissions	40 CFR Part 72	Permits (Title V)	X	X	X	X	X						X		
Solid/Liquid Waste	40 CFR Parts 261-265	Hazardous Waste – RCRA	X	X	X	X	X		X	X					
Solid/Liquid Waste	40 CFR Part 279	Standards for the Management of Used Oil							X	X			X		
Solid/Liquid Waste	40 CFR Parts 265, 280	Underground Storage Tanks (USTs)									X	X			
Solid/Liquid Waste	40 CFR Part 300	Hazardous Ranking System (HRS)	X	X	X	X	X	X	X	X		X			
Solid/Liquid Waste	40 CFR Part 302	Hazardous Substances and Reportable Quantities	X	X	X	X	X	X	X	X					

Example 4-1: Regulatory Checklist for Foundry Facilities

Identification			Production Process					Facility Support							
Category	Legal and Other Requirements	Description	Melting	Core Making	Molding	Pouring, Cooling and Shakeout	Grinding and Finishing	Purchase of Raw Material	Facility Plant Maintenance	Tank Farm and Fuel Transfer	Chemical and Waste Storage	Administration	Generation of Power, Compressed Air, Steam, and Process Water	Medical Facilities for Employees	All*
Solid/Liquid Waste	40 CFR Part 311	Hazardous Materials Management/Worker Protection	X												
Solid/Liquid Waste	40 CFR Part 355	Extremely Hazardous Substances (EHS)	X	X	X	X	X	X	X	X					
Solid/Liquid Waste	40 CFR Part 710	Toxic Substances Control Act (TSCA)						X			X				
Solid/Liquid Waste	CERCLA 103	Hazardous Waste Storage	X	X	X	X	X		X	X	X				
Waste Water Discharge	NPDES State Permit	Stormwater Discharge Permits		X	X	X	X		X	X	X		X		
Waste Water Discharge	40 CFR Parts 121-125	NPDES 122 Stormwater Discharge Permits	X	X	X	X	X		X	X					
Waste Water Discharge	40 CFR Parts 400-409	Effluent Guidelines and Standards	X	X	X	X	X		X	X			X		
Spills	40 CFR Part 112	Oil Spill Prevention (SPCC)							X	X	X				

Example 4-1: Regulatory Checklist for Foundry Facilities

Identification			Production Process					Facility Support							
Category	Legal and Other Requirements	Description	Melting	Core Making	Molding	Pouring, Cooling and Shakeout	Grinding and Finishing	Purchase of Raw Material	Facility Plant Maintenance	Tank Farm and Fuel Transfer	Chemical and Waste Storage	Administration	Generation of Power, Compressed Air, Steam, and Process Water	Medical Facilities for Employees	All*
Emergency Planning and Community Right to Know	29 CFR Part 1910.1200 and 40 CFR Part 370	MSDSs on Chemicals Required by OSHA	X	X	X	X	X	X	X	X					
Emergency Planning and Community Right to Know	40 CFR Part 372	Form R (TRI) Toxic Substances Processed or Used in Excess Quantities	X	X	X	X	X	X	X	X	X			X	
PCBs	40 CFR Part 761	PCB Regulations											X		

* Applicable to all components of the facility.

MODULE 5: OBJECTIVES AND TARGETS

Guidance and Tools

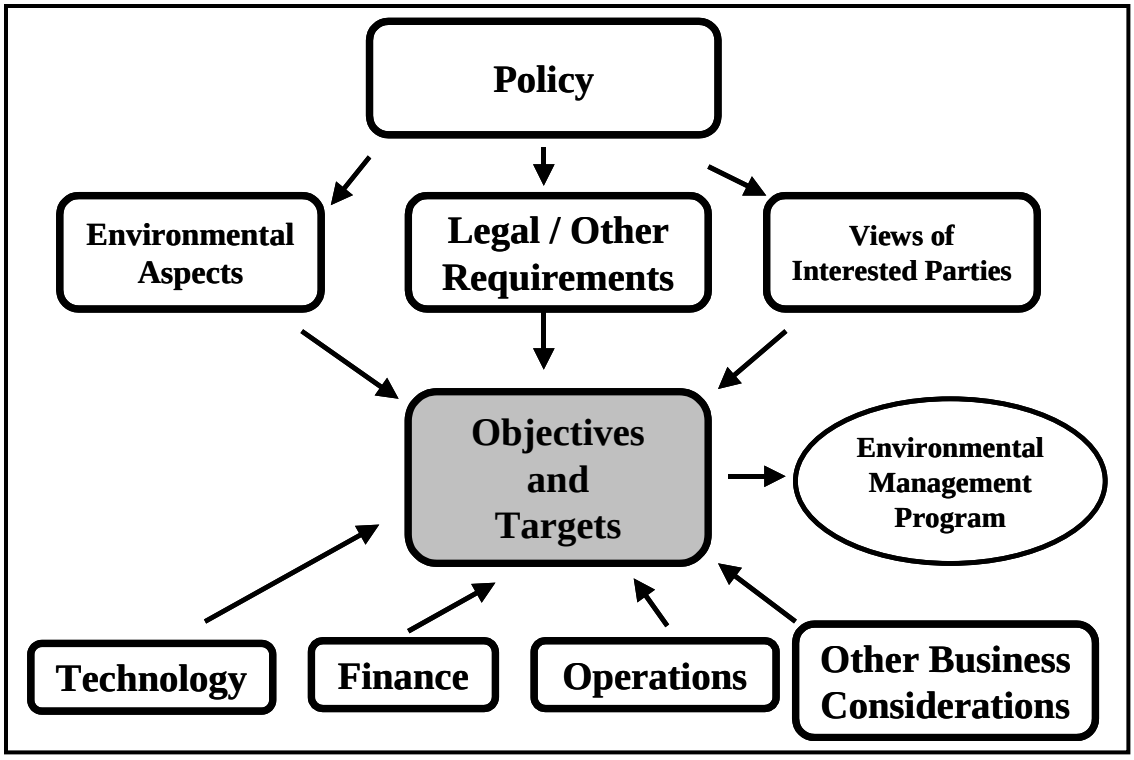
Section 4.3.3 of ISO 14001 requires organizations to establish environmental objectives and targets.

> ***Objectives:*** Overall environmental goals arising from the environmental policy that the facility determines to achieve, and are quantifiable where practical.
>
> ***Targets***: Detailed performance requirements (quantified wherever practicable) based on an environmental objective. The target needs to be set and met in order for the environmental objective to be achieved.

You determine what objectives and targets are appropriate for your organization. These goals can be applied organization-wide or to individual units, departments, or functions – depending on where the implementing actions will be needed.

In setting objectives, keep in mind your environmental policy, including its "pillars." You should also consider your significant environmental aspects, applicable legal and other requirements, the views of interested parties, your technological options, and financial, operational, and other organizational considerations. **Tool 5-1: Considerations for Developing Objectives and Targets** summarizes correlations of the considerations mentioned above.

Tool 5-1: Considerations for Developing Objectives and Targets



There are no "standard" environmental objectives that make sense for all organizations. Your objectives and targets should reflect what your organization does, how well it is performing, and what it wants to achieve.

Here are some things to think about to expedite the determination of your facility's environmental objectives and targets:

- Setting objectives and targets should involve people in the relevant functional area(s). These people should be well positioned to establish, plan for, and achieve these goals. Involving people helps to build commitment.
- Get top management buy-in for your objectives. This should help to ensure that adequate resources are applied and that the objectives are integrated with other organizational goals.
- In communicating objectives to employees, try to link the objectives to the actual environmental improvements being sought. This should give people something tangible to work towards.
- Objectives should be consistent with your overall mission and plan and the key commitments established in your policy (pollution prevention, continual improvement, and compliance). Targets should be sufficiently clear to answer the question: "Did we achieve our objectives?"
- Be flexible in your objectives. Define a desired result, then let the people responsible determine how to achieve the result.
- Objectives can be established to maintain current levels of performance as well as to improve performance. For some environmental aspects you might have both maintenance and improvement objectives.
- Communicate your progress in achieving objectives and targets across the organization. Consider a regular report on this progress at staff meetings.
- To obtain the views of interested parties, consider holding an open house or establishing a focus group with people in the community. These activities can have other payoffs as well.
- It is best to start with a limited number of objectives (three to five) and then expand the list over time. Keep your objectives simple initially, gain some early successes, and then build on them.
- Make sure your objectives and targets are realistic. Determine how you will measure progress towards achieving them.
- Keep in mind that your suppliers (of service or materials) can help you in meeting your objectives and targets (e.g., by providing more "environmentally friendly" products).
- If an environmental aspect is not significant then it does not need an objective and target.

Use your answers to the questions provided in **Tool 5-2: Objectives and Targets Worksheet** to help you begin the process of determining your facility's objectives and targets. A sample procedure for identifying objectives and targets is provided in **Tool 5-3: Sample Procedure for Identification of Objectives and Targets**.

Tool 5-2: Objectives and Targets Worksheet

Questions	Your Answers
Do we have an **existing process** for setting and reviewing environmental objectives and targets? If so, does that process need to be revised? In what way(s)?	
Who needs to be involved in this process within our organization? Should any outside parties be involved?	
When is the **best time** for us to implement this process? Can it be **linked** to another existing organizational process (like our annual or strategic planning process)?	
What are our **existing environmental goals**? How were these developed? Who was involved? What **factors** were considered in setting these goals?	
Who are our **interested parties**? How do we **obtain their views**? **How effective** has our process been?	
How can we effectively and efficiently **track our progress** and **communicate the results**? **Who** is in the best position to do this?	
Our next step on environmental objectives and targets is to …	

Tool 5-3: Sample Procedure for Identification of Objectives and Targets

1.0 Purpose

[Your Facility's Name] sets objectives for environmental improvement and develops targets and action plans to meet those objectives. These objectives are directly related to the company's significant environmental aspects and follow from its environmental policy commitments.

2.0 Procedure

2.1 Top plant management sets environmental objectives for **[Your Facility's Name]** such that the plant has one or more environmental objectives at any one time. The environmental objectives and targets are recorded using **Tool 3-2**. For every significant environmental aspect, an appropriate objective and target will be established.

2.2 The Cross Functional Team is responsible for developing and recommending potential new environmental objectives to top plant management. In identifying potential new objectives, the CFT considers the following:

- Environmental policy
- The significant environmental aspects of the company
- Applicable laws and regulations and potential future laws and regulations
- Practical business criteria, such as the potential costs and benefits of pursuing a particular environmental objective
- The views of employees and other interested parties

2.3 Once environmental objectives are established by top plant management, the Environmental Management Representative (EMR) assigns responsibility (to the manager of the operations in question, where appropriate) for developing targets and action plans to realize the objectives. Sometimes, this may require an alternatives evaluation as the first target (or action item). **This will be developed in *Module 6*.**

3.0 Frequency

Environmental objectives are reviewed on a yearly basis. The targets and action plans are developed and revised as needed by the CFT.

4.0 Records

Environmental objectives are recorded using **Tool 3-2** and the targets and Environmental Management Programs (EMPs) that correspond to each objective are recorded using **Tool 6-2: Sample Form for Environmental Management Programs**. The EMR or designee is responsible for maintaining these records.

Examples

Examples 5-1 and **5-2** provide possible objectives and targets for hypothetical foundries.

Example 5-1: Possible Objectives and Targets Organized by Category

Objectives	Targets
Supplies	
Reduce use of silica sand	Improve process control in core making and molding areas to reduce core and mold scrap by 10%.
Reduce amount of supplies used	Increase recycling of supplies (abrasive media, oil, wood, plastic, laser cartridges, metal, paint booth water) by January 2005. Implement reuse program by January 2005.
Chemicals	
Reduce use of hazardous chemicals	Increase use of low-hazard mold parting agent by 15% by January 2005 (based on 2003 usage rates).
Energy Use	
Reduce energy use	Reduce electricity use by 10% by January 2005 (based on 2003 usage rates). Reduce natural gas use by 15% by January 2005 (based on 2003 usage rates).
Water Use	
Reduce water use	Reduce water use by 10% by January 2005 (based on 2003 usage rates).
Air Emissions	
Reduce air emissions	Evaluate paving roadways to reduce fugitive road dust. Reduce air emissions by 10% by January 2005 (primarily particulates and VOCs).
Noise/Odor/Radiation	
Reduce odor releases	Conduct study to identify odor sources by 3rd quarter 2004.
Water Discharges	
Improve process wastewater quality	Create water balance through sampling project by 3rd quarter 2004.
Improve storm water discharge quality	Cover scrap bins by summer 2005.
Solid/Liquid Wastes	
Paint waste reduction	Modify purchasing procedures to eliminate bulk paint purchases when no immediate use is identified.
Hazardous waste reduction	Reduce hazardous waste by 15% by January 2005 (based on 2003 production rates).
Spills	
Reduce occurrence of spills	Reduce spill occurrence by 10% by January 2005.

Example 5-2: Possible Objectives and Targets Organized by Category

Area/Activity	Significant Aspect/Impact	Objective	Target	Responsibility	Action Plan	Review Frequency	Accomplishment Status
• Metal Casting • Induction Furnace	Natural Resources	Reduce the use of electricity.	Reduce electrical consumption by 3% based on the 2003 consumption levels. Measure use based on kilowatt-hours per ton of melted metal.	Joe Stephens	#1	Every 6 Months	
• Molding • Maintenance	Excess Sand Disposal	Reduce sand disposal by 20%.	Obtain regulatory approval for beneficial use of sand. Reuse sand in asphalt.	Mark Royer	#2	Every 6 Months	
• Grinding and Finishing • Maintenance	Waste Disposal	Eliminate grinding of casting X-38.	Outsource grinding of casting X-38 to qualified vendors.	Rick Brushel	#3	Every 6 Months	
• Molding • Binder Addition • Gas-fired Smelting	Air Emissions	Reduce VOC emissions from A-Line Sand System by 10%. Reduce particulate emissions.	Investigate feasibility of low VOC and particulate binder systems. Develop plan for implementation.	Jerry Newsome	#4	Every 6 Months	

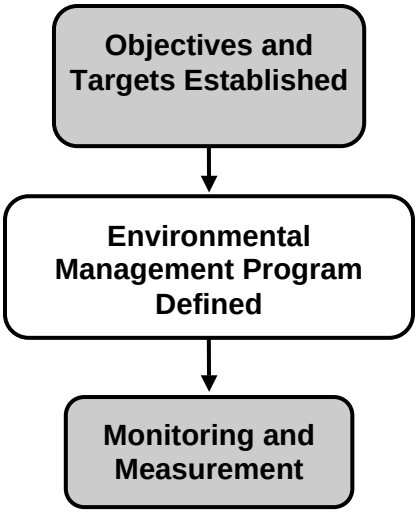
When establishing its environmental objectives, the facility considered its legal and other requirements, its significant environmental aspects, its technological options, and its financial, operational, and business requirements and the views of interested parties.

Approved by: _____ Date: _____

Title: _____

MODULE 6: ENVIRONMENTAL MANAGEMENT PROGRAMS

Guidance and Tools



Section 4.3.4 of ISO 14001 requires organizations to establish and maintain programs for achieving their objectives and targets. These are referred to as **environmental management programs (EMPs)**. EMPs consist of action plans that are necessary to achieve environmental objectives and targets. Therefore, your EMPs should be linked directly to your objectives and targets — that is, they form the bridge between concept and application. Progress toward objectives and targets should be measurable (see *Module 13*).

To ensure its effectiveness, your EMP should define:

- The responsibilities for achieving targets (who will do it?);
- The steps for achieving targets (how will they do it and what specifically will be done?); and
- The time frame for achieving those targets (when will they do it?).

If you don't have enough information to create a quantifiable target, then one of the steps of the program should be to collect data or evaluate the program in the effort of establishing a measurable target later.

Keep in mind that your EMPs should be **dynamic**. For example, consider modifying your programs when:

- Objectives and targets are modified or added;
- Relevant legal requirements are introduced or changed;
- Substantial progress in achieving your objectives and targets has been made (or has not been made); or
- Your products, services, processes, or facilities change or other issues arise.

Your action plan need not be compiled into a single document. A “road map” to several action plans is an acceptable alternative, as long as the key responsibilities, tactical steps, resource needs, and schedules are defined adequately in these other documents.

Here are some things to think about to expedite the planning for and implementation of your facility's EMP:

- Build on the plans and programs you have now for compliance, health & safety, or quality management.
- Involve your employees early in establishing and carrying out the program.
- Clearly communicate the expectations and responsibilities defined in the program to those who need to know.
- In some cases, your EMP may encompass a number of existing operating procedures or work instructions for particular operations or activities. In other cases, new operating procedures or work instructions might be required to implement the program.
- Re-evaluate your action plan when you are considering changes to your products, processes, facilities, or materials. Make this re-evaluation part of your change management process.
- Keep it simple and focus on continual improvement of the program over time.

There may be real opportunities here! Coordinating your environmental program with your overall plans and strategies may position your organization to exploit some significant cost-saving opportunities.

Use your answers to the questions provided in **Tool 6-1: Environmental Management Program Worksheet** to help you begin the process of planning for and implementing your EMP. An example of a form you can use to document your action plans is provided in **Tool 6-2: Sample Form for Environmental Management Program**s.

Change is an important part of business survival for most companies. Products, technologies, and ways of doing things are updated regularly. To avoid creating new "significant environmental aspects" that must be addressed later, it is helpful to integrate new processes, products, and activities into the EMP that you are developing for the rest of your company. You can do so by setting up a procedure for reviewing new processes, products, or activities while they are in the planning stage. One way to accomplish this is to create a sign-off form to be circulated among the people responsible for, or affected by, the new process or product, including those responsible for the area of the company where the new process or activity will be implemented.

A procedure for environmental reviews is provided in **Tool 6-3: Sample Procedure for Environmental Review for New Purchases, Processes, and Products**. **Tool 6-4: Sample New Purchase Approval Form for Environmental Review of New Processes, Products, and Activities** is an example of a sign-off form that can be used for such reviews. The form is a model that should be modified to reflect your company's activities and environmental policy.

Tool 6-1: Environmental Management Program Worksheet

Questions	Your Answers
Do we have an **existing process** for establishing environmental management programs? If yes, does that process need to be revised? In what way?	
What environmental management programs do we have **in place now**?	
What is the **basis** for our environmental management programs (for example, do they consider our environmental objectives, our environmental policy commitments, and other organizational priorities)?	
Who needs to be involved in the design and implementation of these programs within our organization?	
When is the **best time** for us to establish and review such programs? Can this effort be **linked** to an existing organization process (such as our budget, planning, or auditing cycles)?	
How do we ensure that **changes to products, processes, equipment, and infrastructure** are considered in our programs?	
How will we otherwise keep our programs **up-to-date**?	
Our next step on environmental management programs is to …	

Tool 6-2: Sample Form for Environmental Management Programs

Area/Department(s): _____

Process: _____

Significant Aspect: _____

Legal & Regulatory Requirement: _____

Objective: _____

Target: _____

Category : ☐ Improve ☐ Control ☐ Investigate

Action Plan: _____

Task/Action Items	Responsible Party	Responsibilities	Resources Needed	Project Start Date	Project Completion Date	Comments/Deliverables

See **Example 6-1: Environmental Management Program for Reduction of Permitted Air Emissions** and **Example 6-2: Environmental Management Program for Solid Waste from the Sand System** on how to fill out this form.

Tool 6-3: Sample Procedure for Environmental Review for New Purchases, Processes, and Products

[Note: This procedure will almost certainly need to be substantially modified in order to fit the situation of your company. Smaller companies may not have a formal new product design or facilities engineering group, for example. The key is to find a way (that can be documented and verified, if possible) of ensuring that when new chemicals are being purchased, when new products are being developed, or when a facility is being substantially modified, environmental considerations are taken into account.

1.0 Purpose

When purchasing new chemical supplies, modifying its processes, and making new products, **[Your Facility's Name]** strives to ensure that environmental considerations, particularly those related to significant environmental aspects (SEAs), are taken into account.

2.0 Procedure

2.1 When processing an order for a new chemical or other potentially harmful input, the purchasing manager clears the purchase with a member of the Cross Functional Team (CFT). The CFT member initials the box marked "environmental approval" in the New Purchase Approval Form to signify his or her approval of the purchase.

2.2 **[Your Facility's Name]** has a product development group and facilities engineering group. The product development group develops potential new products that **[Your Facility's Name]** could offer (sometimes these are identified by the sales and marketing group, sometimes they are identified internally). The facilities engineering group is responsible for reconfiguring (or, in some cases, expanding) the facility's production lines to produce new products.

2.3 The product development group notifies a member of the CFT before final approval of a new product design. The CFT member reviews the design in light of the facility's SEAs and environmental objectives and targets. When the CFT member is satisfied that the new design is in accordance with the plant's environmental goals, s/he initials the appropriate box in the Design Approval Form, which is sent to the president for approval.

2.4 The facilities engineering group is responsible for notifying a member of the CFT before final approval of any Facility Modification or Expansion Plan. (The Facility Modification or Expansion Plan is required for any facilities engineering job that costs more than $20,000.) The CFT member reviews the plan in light of the facility's SEAs and environmental objectives and targets. When the CFT member is satisfied that the new design is in accordance with the plant's environmental management goals, s/he initials the appropriate box in the Facility Modification or Expansion Plan form, which is sent to the operations manager for ultimate approval.

3.0 Frequency

As new chemicals are purchased, new products are developed, and/or production lines are modified.

4.0 Records

The New Purchase Approval Forms are maintained by the purchasing manager. The Design Approval Forms are maintained by the product development group. The Facility Modification or Expansion Plans are maintained by the facilities engineering group.

Tool 6-4: Sample New Purchase Approval Form for Environmental Review of New Processes, Products, and Activities

Area Company	New Process, Product, or Activity	Environmental Review by Manager/Date	Environmental Effects	Pollution Prevention Opportunities
Contact for form:			Date Completed:	

Examples

Example 6-1: Environmental Management Program for Reduction of Permitted Air Emissions and **Example 6-2: Environmental Management Program for Solid Waste from the Sand System** provide completed examples of **Tool 6-2: Sample Form for Environmental Management Programs**.

Example 6-1: Environmental Management Program for Reduction of Permitted Air Emissions

Area/Department(s): All areas with permitted emissions
Process: All
Significant Aspect: Point Sources, Particulate Matter (PM10), VOC, Cl^- emissions, CO, H2S, NOX, Chemical, Odiferous Compounds, and Other Nuisance Emissions
Legal & Regulatory Requirement: None

Objective: Reduce Permitted Emissions
Target: 10% Reduction by January 2005, relative to year 2003 baseline)

Category: [X] Control/Maintain [X] Improve [ ] Study or Investigate

Task/Action Items	Responsible Party	Resources Needed	Project Start Date	Project Completion Date	Comments (C)/Deliverables (D)
Develop preliminary evaluation of technical feasibility and cost effectiveness of gas-fired smelter modification alternatives	Facility Maintenance Coordinator	Vendor quotes, estimate of reductions	2/1/2004	3/01/2004	D – Technical feasibility report of process modification alternatives D – Comparative cost analysis of process modification alternatives
Develop preliminary evaluation of technical feasibility and cost effectiveness to reduce particulates from mold making, melting, tapping, blasting, grinding, and finishing	Facility Maintenance Coordinator	Vendor quotes, estimate of reductions	2/1/2004	3/01/2004	D – Technical feasibility report of process modification alternatives D – Comparative cost analysis of process modification alternatives

Task/Action Items	Responsible Party	Resources Needed	Project Start Date	Project Completion Date	Comments (C)/Deliverables (D)
Develop preliminary evaluation of technical feasibility and cost effectiveness to reduce chlorine emissions from chlorine de-magging	Facility Maintenance Coordinator	Vendor quotes, estimate of reductions	2/1/2004	3/01/2004	D – Technical feasibility report of process modification alternatives D – Comparative cost analysis of process modification alternatives
Compile emission reduction results	Environmental Coordinator	Emissions data	11/1/2003	1/31/2005	D – Prepare report of results and recommendations

Example 6-2: Environmental Management Program for Solid Waste from the Sand System

Area/Department(s): Maintenance
Process: Sand System
Significant Aspect: Solid Waste from the Sand System
Legal & Regulatory Requirement: Yes (40 CFR, state rules and regulations, company directive)

Objective: Study waste reduction

Target: Complete study by March 2002 (relative to year 2001 baseline)

Category: [ ] Control/Maintain [ ] Improve [X] Investigate

No. 1 Action Plan: Study of Potential Waste Reduction

Task/Action Items	Responsible Party	Resources Needed	Project Start Date	Project Completion Date	Comments (C)/Deliverables (D)
Identify potential waste reduction initiative	John Smith, Environmental Manger		August 1, 2001	October 1, 2001	D-List of steps to be taken to fulfill initiative and responsibilities
Identify list of suitable technology to achieve volume reduction	CFT		October 1, 2001	October 31,, 2001	D-List of potential technology
Identify list of suitable vendors that supply technology available to achieve volume reduction	CFT		November 1, 2001	November 31, 2001	D-List of potential vendors of compactors and waste compaction technology
Develop evaluation on technical feasibility and cost effectiveness of select compacting products	CFT		December 1, 2001	February 1, 2001	D-Comparative cost analysis of compactor technology D-Technical feasibility analysis of select compactor technology

Task/Action Items	Responsible Party	Resources Needed	Project Start Date	Project Completion Date	Comments (C)/Deliverables (D)
Present recommendation to management for waste reduction	CFT		March 1, 2002	March 31, 2002	D-List of evaluations and recommendations for waste reduction

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MODULE 7: STRUCTURE AND RESPONSIBILITY

Guidance and Tools

As discussed in *Module 1*, it is important to designate, as soon as possible, the Environmental Management Representative (EMR), the EMS Coordinator, and members of the Cross Functional Team (CFT) who will be responsible for promoting and developing your EMS. It is also important to designate who will be responsible for other environmental activities.

This module addresses the task of creating an ongoing structure that ensures the facility is equipped with sufficient personnel and other resources to meet its objectives and targets and to ensure compliance with legal requirements. The facility should also provide appropriate incentives for personnel to meet the EMS requirements.

Tool 7-1: Structure & Responsibility Worksheet is a set of questions for you to consider in establishing the structure and responsibility element of your EMS. **Tool 7-2: Sample EMS Responsibilities Descriptions** provides an example descriptions of roles and responsibilities associated with an EMS that can be placed in your facility's EMS Manual. When complete, **Tool 7-3: Sample EMS Responsibilities Form** can provide documentation of who in your facility fill key EMS roles.

Throughout the process of assigning responsible persons in the EMS, it is important to take into consideration the job functions and skills that would make a strong contribution to the EMS team. **Tool 7-4: Functions to Include in Your EMS Team and Possible Roles** provides a list to help identify these skills. However, the list does not suggest that a company would need all of these skills.

Tool 7-1: Structure & Responsibility Worksheet

Questions	Your Answers
How do we **define roles, responsibilities, and authorities** for environmental management now? Is this process **effective?**	
Who is / should be our **Environmental Management Representative**? Does this individual have the necessary authority to carry out the responsibilities of this job?	
Are our key roles and responsibilities for environmental management **documented** in some manner? If so, how (e.g., job descriptions, organizational charts, responsibility matrix, etc.)?	
How are EMS roles and responsibilities **communicated** within our organization?	
How do we ensure that **adequate resources** have been allocated for environmental management? How is this process **integrated** with our overall budgeting process? How are environmental expenditures **tracked**?	
How will we keep this information **up-to-date**?	
Our next step on structure and responsibility is to …	

Tool 7-2: Sample EMS Responsibilities Descriptions

[Your Facility's Name] has established an Environmental Management Representative (EMR), an EMS Coordinator, and a Cross Functional Team (CFT) with the following responsibilities:

- *Environmental Management Representative.* The EMR is the member of **[Your Facility's Name]** top plant management group responsible for the functioning of the EMS. It is his or her job to ensure that all tasks relating to the EMS are identified and completed in a timely manner. He or she is also responsible for reporting periodically to the top plant management group on the progress and results of the EMS.

- *EMS Coordinator*. The EMS Coordinator's responsibility is to identify, assign, schedule, provide the necessary support for, and ensure completion of all tasks relating to the EMS. The Coordinator works closely with the Management Representative and with the CFT. The EMS Coordinator is also responsible for maintaining this EMS Manual, under the leadership of the EMR. *The functions of Coordinator and EMR may be filled by the same person.*

- *Cross Functional Team.* The CFT (which also serves as the plant's safety committee) is comprised of 6-8 supervisors and employees from major groups or areas within the plant. The CFT is responsible for ensuring that EMS activities in their areas are carried out and for reporting the results of these activities to the team as a whole. In addition, the CFT itself undertakes certain EMS activities such as the selection of significant environmental aspects. The CFT meets to discuss the EMS on at least a monthly basis.

Records

The EMS Coordinator maintains an updated list of EMR, EMS Coordinator, and CFT members using **Tool 7-3: Sample EMS Responsibilities Form**.

Tool 7-3: Sample EMS Responsibilities Form

The following table lists **[Your Facility's Name]** Environmental Management Representative, EMS Coordinator, and Cross Functional Team members:

EMS Function	Name	Regular Position
Environmental Management Representative		
EMS Coordinator		
Cross Functional Team members		

Tool 7-4: Functions to Include in Your EMS Team and Possible Roles

Company Function	Expertise Brought to EMS Team	How They Can Help (Possible Roles)
Production	Management of environmental aspects of production	Help identify aspects; provide input to objectives and targets; participate in environmental management programs; serve as trainers and internal auditors; help carry-out corrective and preventive action
Maintenance	Management of environmental aspects of equipment maintenance	Implement preventive maintenance program for key equipment; support identification of environmental aspects
Facilities Engineering	Management of environmental aspects of new construction and installation/modification of equipment	Consider environmental impacts of new or modified products and processes; identify pollution prevention opportunities
Storage/Inventory	Management of environmental aspects of raw material and product storage and in-facility transportation	Help identify aspects; provide input to objectives and targets; participate in environmental management programs; serve as trainers and internal auditors; help carry-out corrective and preventive action
Shipping, Receiving, Transportation, Logistics	Management of environmental aspects of shipping, receiving, and transportation	Help identify aspects; provide input to objectives and targets; participate in environmental management programs; serve as trainers and internal auditors; help carry-out corrective and preventive action
Product Design	System for examining environmental aspects of new designs	Participate in product-related objectives, targets, and EMPs
Quality	Quality management system, including document control procedures	Support document control, records management, and employee training efforts; support integration of environmental and quality management systems
Human Resources	Training on environmental issues and inclusion of environmental incentives in performance measurement system	Define competency requirements and job descriptions for various EMS roles; train temporary workers and contractors; maintain training records; integrate environmental management into reward, discipline, and appraisal systems

Company Function	Expertise Brought to EMS Team	How They Can Help (Possible Roles)
Environmental	System for complying with environmental regulations and management of environmental records	Provide an organizational and functional role in establishing and maintaining the EMS
Purchasing	System for procurement (including screening of suppliers, material composition of components)	Develop and implement controls for chemical/other material purchases and for communicating requirements to contractors and suppliers
Sales/Marketing	Environment-related commitments to customers	Assist with communications with external stakeholders
Public Relations	System for communicating with public on environmental issues	Assist with communications with external stakeholders
Accounting/Finance	System for tracking environmental costs of operations	Track data on environmental-related costs (such as resource, material, and energy costs, waste disposal costs, etc.); prepare budgets for environmental management program; evaluate economic feasibility of environmental projects
Line Workers	Thorough knowledge of processes and operations	Provide first-hand knowledge of environmental aspects of their operations; support training for new employees
Top Management	Capability for ensuring continual improvement	Communicate importance of EMS throughout organization; provide necessary resources; track and review EMS performance

Examples

Example 7-1: Responsibility Matrix lists EMS activities and how they might apply to the various facility personnel that perform these and other facility functions.

Example 7-1: Responsibility Matrix

Legend: L=Lead Role
S=Supporting Role

	Plant Manager	EHS Manager	HR Manager	Maintenance	Purchasing/ Materials	Engineering	Production Supervisor(s)	Finance	EMR	Employees
Communicate importance of environmental management	L	S					S			
Coordinate auditing efforts		L		S			S			
Track/analyze new regulations (and maintain library)		L								
Obtain permits and develop compliance plans		L				S				
Prepare reports required by regulations		L								
Coordinate communications with interested parties			L							
Train employees		S					L			
Integrate environmental into recruiting practices			L							
Integrate environmental into performance appraisal process			L							
Communicate with contractors on environmental expectations					L					
Comply with applicable regulatory requirements	L	L	S	S	S	S	S	S	S	S
Conform with organization's EMS requirements	L	L	S	S	S	S	S	S	S	S
Maintain equipment / tools to control environmental impact				L						
Monitor key processes		S					L			
Coordinate emergency response efforts	L	S								
Identify environmental aspects of products, activities, or services	S	L	S	S	S	S	S	S	S	
Establish environmental objectives and targets	L	S					S			
Develop budget for environmental management		S						L		

	Plant Manager	EHS Manager	HR Manager	Maintenance	Purchasing/ Materials	Engineering	Production Supervisor(s)	Finance	EMR	Employees
Maintain EMS records (training, etc.)		L								
Coordinate EMS document control efforts					S				L	

MODULE 8: TRAINING, AWARENESS, AND COMPETENCE

Guidance and Tools

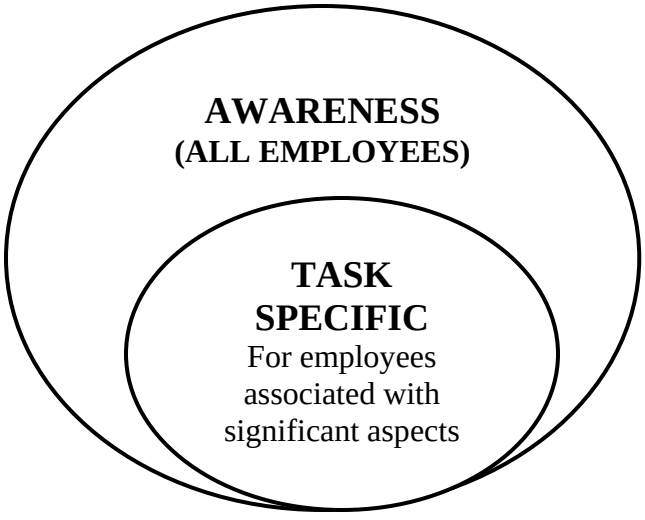
Section 4.4.2 of ISO 14001 requires organizations to identify training needs and to establish training procedures. It requires that all personnel, whose work may create a significant impact on the environment, receive appropriate training. Personnel performing the tasks that can cause significant environmental impacts must be competent on the basis of appropriate education, training, and/or experience.

As shown in **Tool 8-1**, every employee should be aware of the environmental policy, the significant environmental impacts of their work activities, key EMS roles and responsibilities, procedures that apply to their work, and the importance of conformance with EMS requirements. Employees also should understand the potential consequences of not following EMS requirements (such as spills, releases, and fines or other penalties).

Training should be tailored to the different needs of various levels or functions in the organization. However, training is just one element of establishing competence, which is typically based on a combination of education, training, and experience. For certain jobs (particularly tasks that can cause significant environmental impacts), you should establish criteria to measure the competence of individuals performing those tasks.

Training is needed both in technical work and for general awareness on the part of all employees.

Tool 8-1: Two Areas of EMS Training



The following are some examples of areas where training is needed:

- Legal requirements;
- Ability to recognize new problems;

- Technical skills needed to solve problems;
- Procedures to implement operational controls;
- Any new procedures or needs related to significant environmental aspects; and
- Awareness of the company's environmental policy and the EMS and its objectives.

Don't overlook the need for ongoing training when experiencing employee turnover. Be sure that new employees are trained soon after they arrive.

Go through the action steps listed below and use **Tool 8-2: Training, Awareness & Competence Worksheet** to help you identify, plan for, and track the training needed to assist in developing and putting your EMS in place.

- Identify all job functions that affect the environment. Small companies may wish to identify individuals. Identify who is responsible for employee health and safety.
- Identify the training and type of training these people currently receive that relates to environmental and health and safety concerns.
- Determine if EMS education could be included in this training or whether there should be special EMS training, at least in the beginning.
- Identify training materials or programs available outside your company. Some places to check include:
    - Trade associations;
    - Small Business Administration;
    - EPA;
    - State Departments of Environmental Protection;
    - Suppliers; and
    - Certified contractors.

You will probably be able to identify some general training needs now, but will need to return to this module to add specific technical training needs that may be identified as you proceed with the EMS. **Tool 8-3** provides a sample Training Needs Analysis Form.

Tool 8-2: Training, Awareness & Competence Worksheet

Questions	Your Answers
Do we have an existing process **for environmental training?** If so, does that process need to be revised? In what way(s)?	
What types of training do we provide now (e.g., new employee orientation, contractor training, safety training)? How would EMS-related training fit with our existing training program?	
Who is responsible for training now? Who else might need to be involved within our organization?	
How do we determine **training needs** now? (List methods used.) Are these processes effective?	
Who is **responsible** for ensuring that employees receive appropriate training? How do we **track training** to ensure we are on target?	
How do we **evaluate training effectiveness?** (List methods used, such as course evaluation, post-training testing, behavior observation.)	
How do we establish competency**, where needed?** (List methods used, such as professional certifications.) What are the **key job functions and activities** where we need to ensure environmental competency?	
Our next step on training, awareness & competence is to …	

Tool 8-3: Sample Training Needs Analysis Form

Jobs Affecting Environment	Training Needs	How to Train	When/Length	Budget	Completion Date	Who is Responsible
Contact Person:			Date Completed:			

See **Example 8-1: Training Needs Analysis Form** on how to fill out this form.

Examples

Example 8-1 provides abbreviated information on how to fill out **Tool 8-3**.

Example 8-1: Training Needs Analysis Form

Jobs Affecting Environment	Training Needs	How to Train	When/Length	Budget	Completion Date	Who is Responsible
Staff EH&S Person	Environmental Policy	Staff Training Session	Once/Two hrs.	?	?	?
Production Employees	Emergency Preparedness & Response					
Contact Person:			Date Completed:			

MODULE 9: COMMUNICATION

Guidance and Tools

Section 4.4.3 of ISO 14001 requires organizations to establish procedures for internal and external communication of environmental activities. This communication should:

- Demonstrate management's commitment to the environment;
- Make others aware of the organization's environmental policy and commitment to the environment;
- Address concerns about the organization's environmental activities by external parties;
- Establish a line of communication that clearly defines emergency responsibilities; and
- Distribute throughout the organization relevant information regarding the EMS, including the facility's environmental performance improvements.

Identifying Stakeholders

Stakeholders include anyone who has a stake in your company's environmental performance. This group can play an important role in helping your company develop an EMS. Employees have strong stakeholder interest in your company and can provide substantial support for EMS development. Customers, suppliers, and neighbors can provide useful inputs. In addition, establishing partnerships with trade associations, suppliers, professional associations, and community colleges can be very helpful in developing parts of your EMS.

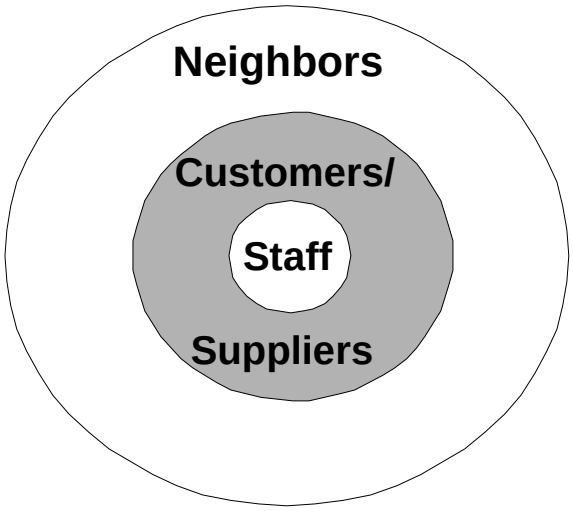
The following list provides types of stakeholders:

Internal Stakeholders	**External Stakeholders**
• Employees • Shareholders • Customers • Suppliers • Investors & Insurers • Trading Partners	• Neighbors • Community Organizations • Environmental Groups • Larger Companies • The Media • The General Public

How to Work With Your Stakeholders

The next stage of the process is to establish dialogue with stakeholders. You may view this as an opportunity to further refine your understanding of the various interests of the groups. You might think about the different kinds of stakeholders as forming ever-broader circles around your business (see **Tool 9-1**). Begin with the innermost circle and work outward.

Tool 9-1: Levels of Stakeholder Interest



When working with either internal or external stakeholders, including your Cross Functional Team (CFT), effective communication will facilitate a smooth implementation of your EMS. You will want to follow these effective rules of communication:

- **Begin early in the process.** Let people know what you are doing. In most cases, you will need the cooperation of several people within your company to gather information and develop an EMS that will work. In small and large organizations alike, early communication will pay off in greater acceptance of the resulting system.

- **Set your communication objectives.** Decide what you want to achieve in your communication. Setting this goal will help you get the right message across without overwhelming people with too much information, spending too much time, or missing the mark. It is helpful to create an EMS for your company. The procedure should outline what kinds of information will be communicated to external stakeholders, and how the company will document and respond to communications from external stakeholders. The procedure should include who reports what, to whom, and when.

- **Communicate regularly and integrate EMS communication.** To build support for the EMS, try to communicate on a regular basis. Some simple means of regular communication can usually be accomplished without straining resources – for example, a bulletin board posting, email messages, or articles in the organization newsletter. Don't forget to consider direct word-of-mouth communication, particularly in smaller organizations. Talking directly with key individuals at regular intervals may be the best mechanism for ensuring good communication. Use existing channels of communication to get the message out on your EMS activities.

Consider various methods of communication when informing stakeholders about your company and what you are doing, or plan to do, to protect the environment. Methods may include:

- Discussion in company meetings;
- Updating the company Website;
- Scheduling tours of your facility;
- Producing a fact sheet about your facility's activities, the EMS program, and why and how your company would like to include stakeholders;
- Holding public meetings when you feel it is appropriate.

- **Track communication from stakeholders to your company and the response made to that communication.** A procedure for documenting and responding to stakeholder communication should be established and a person appointed to be responsible for carrying it out.

Note: Section 4.4.3 of the Standard states that "the organization shall consider processes for external communication on its significant environmental aspects and record its decision." You may choose to review requests for information on an individual basis and communicate and record your decision. Typically a facility will do its best to respond in kind to all good-faith communications from stakeholders about environmental issues, including complaints, comments, and information requests. However, your facility may not choose to respond in all cases, particularly if the request is made in bad faith or if sensitive information is requested.

Tool 9-2: Communications Worksheet is a set of questions to help you structure your communications approach and lead to improvements. **Tool 9-3: Sample Procedure for Communications with Stakeholder** and associated **Tools 9-4** and **9-5** can augment the previous worksheet. Working through the set of questions in a tabular form may result is a more clear set of action items.

Tool 9-2: Communications Worksheet

Questions	Your Answers
Who are **our key external stakeholders**? How were these stakeholders **identified**?	
With regard to our organization, what are the **key concerns of these stakeholders**? **How do we know** this?	
What **community outreach efforts** are we making now (or have we made in the recent past)? How **successful** have these efforts been?	
What **methods** do we use for external communications? Which appear to be the most **effective**? Who has primary **responsibility** for external communications?	
How do we **gather and analyze information** to be communicated? Who has **responsibility** for this?	
How do we **communicate internally** (as well as with our suppliers and contractors)? What processes do we have to **respond to internal inquiries**, concerns and suggestions? **How effective** are these methods?	
Our next step on communication is to …	

Tool 9-3: Sample Procedure for Communication with Stakeholders

1.0 Purpose

To ensure that interested external stakeholders receive appropriate information about the facility's environmental activities.

2.0 Procedure

2.1 The Cross Functional Team (CFT) identifies stakeholders and their potential interests in the environmental performance of our Facility using **Tool 9-4, Sample Form for Stakeholders and Environmental Issues**. If the CFT decides that proactive communication on environmental issues is necessary with any group, that decision is recorded on **Tool 9-4** and responsibility is designated.

2.2 When any form of communication is received regarding the corporation's environmental performance or management from a stakeholder, that communication is immediately forwarded to the Environmental Management Representative (EMR).

2.3 The EMR considers the nature of the communication and makes a decision on whether and how to respond to it based on the guidance in **Tool 9-4**. The EMR is responsible for maintaining records of each such communication and response using **Tool 9-5**, **Sample Form for Stakeholder Communication Record**. Where internal actions are necessary to address the communication, this is noted on **Tool 9-5** and a Corrective Action Form is initiated.

3.0 Frequency

As per environmental communication.

4.0 Records

Records of environmental communications from stakeholders and your corporation's responses are kept by the EMR and are tracked using **Tool 9-5**. An updated version of **Tool 9-4** is kept in this EMS Manual.

Tool 9-4: Sample Form for Stakeholders and Environmental Issues

Stakeholder	Potential Environmental Interest	Proactive Communication Plan (if desired)	Person Responsible

Contact Person: _____ Date Completed: _____

Tool 9-5: Sample Form for Stakeholder Communication Record

Date Communication Received	
Type of Communication	
Received From	
Address/Telephone Number/ E-Mail	
Content of Communication (attach copy if possible)	
Will [Your Facility's Name] Respond?	YES NO
Date of Response	
Person Responding	
Position	
Nature of Response (attach copy if possible)	
Are Internal Actions Necessary?(If Yes, fill out a Corrective Action Form.)	

Contact Person: _____ Date Completed: _____

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MODULE 10: EMS DOCUMENTATION AND DOCUMENT CONTROL

Guidance and Tools

Requirements for system documentation are presented in several sections of ISO 14001, including Section 4.4.4, Environmental Management System Documentation, and Section 4.4.5, Document Control. Documentation is important to the success of your EMS for several reasons:

- Word-of-mouth information is not as reliable as written documentation.
- Creating documentation helps you assess the progress of your EMS and evaluate results.
- Documentation is vital to maintaining consistency in an EMS over time and from department to department. In most companies, change is a fact of life; new products are developed, the company grows, and employees change positions or leave the company. Accurate documentation will make it much easier to maintain an effective and flexible EMS during these changes.

The EMS Manual

An EMS manual provides a place to identify all relevant environmentally significant procedures and practices in a single source. The EMS manual typically does not house the complete EMS documentation but is rather used as a road map to other associated documents. It should describe what the EMS consists of, where other related documents are located, and where records of performance can be found. It should be a "one-stop-shopping" outline of all other sources of EMS paperwork. For most companies this will be a simple binder, for others it may be a Website.

Other EMS Documentation

In addition to the EMS manual, your organization should maintain other documentation of its EMS. First, you should document the processes used to meet the EMS criteria. (For example, "How do we identify environmental aspects?" "How do we implement corrective actions?") This documentation generally takes the form of system **procedures**. In addition, you might maintain area-or activity-specific documentation (such as **work instructions**) that instructs employees on how to carry out certain operations or activities.

EMS documentation is related to (but not the same as) EMS **records**. EMS **documentation describes** what your system consists of (i.e., what you do and how you do it), while EMS **records demonstrate** that you are doing what the documentation said you would do. *Module 15* provides information on EMS records.

How to Develop Your Documentation

The basic steps in preparing EMS documentation include:

Step 1: Determine how EMS documentation can be integrated into existing documents.

Before you dive into your documentation, learn how deep the water is. Find out what documentation already exists, what its purpose is, and whether it works. The goal of this search is to locate materials you can use to begin your EMS implementation and documentation. Many facilities use the same format for all their documents. An example of existing documentation might be a quality plan or tracking report. See **Tool 10-1** through **Tool 10-4** to assist you in developing EMS documentation while following these steps.

- Keep EMS documentation **simple**. Choose a format that works best for your organization. Your manual does **not** need to describe every detail of your EMS. Instead, the manual can **provide references** to other documents or procedures.

- Use the **results of your preliminary assessment** to prepare your EMS documentation. In the course of conducting this assessment, you should have collected or prepared useful material on how your organization satisfies the selected EMS criteria. The box on the next page illustrates what constitutes EMS documentation.

- The usefulness of your EMS manual can be improved by including the facility's mission statement and vision or guiding principles (if these exist). These will improve understanding of the organization and **how the EMS supports** its overall goals.

- An EMS manual can be a useful tool for explaining your EMS to new employees, customers, and others.

EMS documentation should be updated as needed, based on any system improvements you put in place. However, if you put too much detail in an EMS manual, you might need to update it frequently.

Step 2: Tailor the documentation to your organization's individual needs.

Here are some questions to help you determine what fits your needs:

- How can you incorporate documents that already exist rather than creating new ones?

- Does your business operate in a single location or many? This will affect who creates some of the documents and where they are located. It may also affect how many versions of a document might be necessary to cover different circumstances.

- What is your current computer capability? Many companies use an electronic system to maintain documents.

- What security precautions do you need? As a computer system becomes larger and can be accessed by more people, electronic information can more likely be edited and destroyed. Security, or at least restrictions on who can change data, can be a critical issue for many companies.

Step 3: Determine a standard format for all documents.

Before developing your EMS documents, plan the format (document and page appearance). If a company standard exists, use it. If not, the need for EMS documentation provides an opportunity to create a standard company format. Consider whether pages are single- or double-sided and why; choose margins, header, footer, typefaces, text, headings, etc. Include plans for bulleted and numbered lists, tables, and even paragraph spacing. Once you have a consistent format for documents, anyone who writes one will use the established electronic format and fill in the necessary text. All documents will look like part of an organized, integrated system. Most important, documents will be it easier to read and understand!

What constitutes EMS documentation? Consider the following:

- Your environmental policy;
- Your organizational structure and key responsibilities;
- A description or summary of **how** your organization satisfies EMS requirements (e.g., "How do we identify environmental aspects?" "How do we control documents?" "How do we comply with legal requirements?");
- System-level procedures (e.g., procedure for corrective action);
- Activity- or process-specific procedures/work instructions; and
- Other EMS-related documents (such as emergency response plans, training plans, etc.).

Step 4: Control documents.

To ensure that everyone is working with the proper EMS documents, your organization should have a procedure that describes how such documents are controlled. Implementation of this procedure will ensure the following:

- EMS documents can be located (we know where to find them);
- They are periodically reviewed (we check to make sure they are still valid);
- Current versions are available where needed (we make sure the right people have access to them); and
- Obsolete documents are removed (people won't use the wrong documents by mistake).

Your procedure should designate responsibility and authority for preparing documents, making changes to them and keeping them up-to-date. In other words, you need to make it clear who can actually generate and change documents and the process for doing so.

- Don't make your procedure more complicated than it needs to be. While larger organizations often have complex processes for document control, smaller organizations can use simpler processes.

- Limiting distribution can make the job easier. Could everyone have access to one or a few copies? Determine how many copies you really need and where they should be maintained for ease of access.

- Consider using a paperless system through a local area network or the organization's internal Website. There also are a number of commercial software packages that can simplify the document control effort.

- Prepare a document control index that shows all of your EMS documents and the history of their revision (see **Tool 10-5** through **Tool 10-8**). Include this index in your manual. Also, if multiple paper copies of documents are available at the facility, prepare a distribution list, showing who has each copy and where the copies are located.

- As your procedures or other documents are revised, highlight the changes (by underlining, boldface, etc.). This will make it easier for readers to find the changes.

Tool 10-1: EMS Documentation Worksheet

Questions	Your Answers
Do we have **existing documentation of our EMS**? If yes, how is this EMS documentation **maintained?** (Electronically? In paper form?)	
Who is responsible for maintaining EMS documentation within our organization?	
Do we have an **EMS manual** or other summary document that describes the key elements of the EMS? If so, does this document describe the **linkages** among system elements?	
What does our EMS documentation consist of? (List components such as environmental policy, EMS manual, activity-level procedures or work instructions, emergency plans, etc.)	
Is our EMS documentation **integrated with other organizational documentation** (such as human resource plans or quality procedures)? If so, how do we ensure proper **coordination** between environmental and these other functions?	
How will we keep our EMS documentation **up-to-date**?	
Our next step on EMS documentation is to …	

Tool 10-2: Sample Worksheet for Development of EMS Documentation

List Existing Documents	Determine Format: Who/ Date Completed	Develop Prototype (Content): Who/ Date Completed	Assign Writing: Who/ Date	Review Writing/ Compare to Prototype: Who/ Date	Added to Document List/ Date	Who Has Access	Where Located
	/	/	/	/	/		
	/	/	/	/	/		
	/	/	/	/	/		
	/	/	/	/	/		
List Documents to be Created							
	/	/	/	/	/		
	/	/	/	/	/		
	/	/	/	/	/		
	/	/	/	/	/		
Contact Person:				Date Completed:			

Tool 10-3: Sample Outline for EMS Manual and Other EMS Documents

Basic EMS Manual

- **Index/Revision History/Distribution List**
- **Environmental Policy**
- **Description of How Our EMS Addresses Each of the EMS Elements** (and linkages among these elements)
  - How We Identify Significant Environmental Aspects
  - How We Access and Analyze Legal and Other Requirements
  - How We Establish and Maintain Objectives and Targets
  - How the Organizational Structure Supports EMS (organization charts, key responsibilities)
  - How We Train our Employees and Ensure Competence
  - How We Communicate (internally and externally)
  - How We Control EMS Documents
  - How We Identify Key Processes and Develop Controls for Them
  - How We Prepare for and Respond to Emergencies
  - How We Monitor Key Characteristics of Operations and Activities
  - How We Identify, Investigate, and Correct Nonconformance
  - etc.

Environmental Management Program Description

- **Annual Objectives and Targets**
- **Action Plans** (to achieve objectives and targets)
- **Tracking and Measuring Progress**

EMS Procedures

- **Index/Revision History/Distribution List**
- **Organization-wide Procedures** (for some EMS elements there might be more than one procedure)
  - Environmental Aspects Identification
  - Access to Legal and Other Requirements
  - Training, Awareness, and Competence
  - Internal Communication
  - External Communication
  - Document Control
  - Change Management Process(es)
  - Management of Suppliers / Vendors

- Emergency Preparedness and Response
- Monitoring and Measurement
- Calibration and Maintenance of Monitoring Equipment
- Compliance Evaluation
- Corrective and Preventive Action
- Records Management
- EMS Auditing
- Management Review

• **Procedures/Work Instructions for Specific Operations or Activities**

- Waste Management
- Wastewater Treatment ***(These are examples only)***
- Operation of the Paint Line

Other EMS Documentation (Emergency Response Plans, etc.)

Tool 10-4: Sample Procedure for EMS Documentation

1.0 Purpose

To ensure effective operation of the EMS, **[Your Facility's Name]** documents the procedures of its EMS and keeps records of the outcomes of EMS processes, and of the important environmental issues facing the plant. The EMS Manual comprises the documentation that describes the core elements of the EMS and their interactions and provides direction to related documentation.

2.0 Procedure

The Environmental Management Representative (EMR) documents the procedures that define **[Your Facility's Name]** EMS in the manual. The Cross Functional Team (CFT) formally reviews and, if necessary, revises this manual on an annual basis. Revised manuals are assigned a new revision number (a minor set of revisions would change the number from, say, 1.1 to 1.2; a major revision would change the number from, say, 1.1 to 2.0). Finally, the EMS Coordinator ensures that no employees or managers use outdated revisions of this manual.

3.0 Frequency

Manual review and revision on an annual basis.

4.0 Records

Maintained as outlined in the procedure.

[Tool 10-5 provides you with the beginning framework for document control by presenting you with important questions that need to be addressed. **Tool 10-6** provides an example of a procedure for document control, and **Tool 10-7** and **Tool 10-8** will help you manage your documents once they have been created.**]**

Tool 10-5: Document Control Worksheet

Questions	Your Answers
Do we have an **existing process** for controlling EMS documents? If yes, does that process need to be revised? In what way?	
Who needs to be involved in this process within our organization?	
Who needs **access** to controlled copies of EMS documents? How do we ensure that they have access?	
How do we ensure that EMS documents are **periodically reviewed and updated** as necessary?	
Who has authority to **generate** new documents or **modify** existing ones? How is this process managed?	
How are **users alerted** to the existence of new EMS documents or revisions to existing ones?	
How do we ensure that **obsolete** documents are not used?	
Is our EMS document control process **integrated with other organizational functions** (such as quality)? If so, how do we ensure proper **coordination** between environmental and other functions?	
Our next step on document control is to …	

Tool 10-6: Sample Procedure for Document Control

1.0 Purpose

This procedure defines the mechanism for controlling EMS documents. The purpose of this procedure is to ensure that those personnel requiring access to EMS documents have the most up-to-date versions and are aware of the document control process.

2.0 Procedure

2.1 The Environmental Management Representative (EMR) or designee shall be responsible for coordinating, developing, issuing, and controlling environmental management system documents.

- Procedures shall be in a format that is consistent with other controlled documents at the facility.
- Documentation shall be legible, dated (with dates of revision) and readily identifiable, maintained in an orderly manner, and retained for a specified period.
- The EMR or designee shall maintain a master set of EMS documents.
- Each area or department manager or designee should maintain a list of, or have access to, all EMS documents relevant to their area or department, as applicable.
- Relevant documents are available at the locations where they are needed.
- Personnel ensure current versions are available and used.
- Obsolete document are promptly removed from all points of issue and points of use, or otherwise assured against unintended use.
- The Cross Functional Team shall review and approve changes to EMS documents.
- All controlled documents shall be marked with the words "CONTROLLED DOCUMENT."
- Controlled versions of system documents may be placed on the computer system for access by area or department personnel.
- All controlled documents issued by the EMR or designee shall be recorded on a Master Document List.
- The EMR or designee shall:
  - Provide notice to affected personnel to ensure that they are aware of the new or revised document; and
  - Issue controlled copies of those documents to appropriate personnel.

2.2 The EMS Coordinator is not responsible for maintaining records of environmental training and emergency response preparations; the operational control procedures themselves; or the New Purchase Approval Forms, the Design Approval Forms, or the Facility Expansion or Modification Plans. These records are maintained by the appropriate person or group.

2.3 The EMR or designee will control all EMS documents and records from items 1 and 2 using **Tool 10-7**, **Sample Document Control Form** and **Tool 10-8**, **Sample Document Index Form**.

3.0 Frequency

Manual review and revision on an annual basis.

4.0 Records

Maintained as outlined in the procedure.

Tool 10-7: Sample Document Control Form

Document	Who Will Use It	Permanent Location	Periodic Review Schedule/ Who	When Can Be Destroyed
			/	
			/	
			/	
			/	
			/	
			/	
			/	
			/	
			/	
Contact Person:			Date Completed:	

Tool 10-8: Sample Document Index Form

Document	Revision Number					
	1	2	3	4	5	6
Environmental Policy						
Environmental Manual						
Procedure 1: Environmental Aspects Identification						
Procedure 2: Access to Laws and Regulations						
Procedure 3: Setting Objectives & Targets						
Procedure 4: Environmental Training						
Procedure 5: External Communications						
Procedure 6: Internal Communications						
Procedure 7: Document Control						
Procedure 8: Emergency Preparedness						
Procedure 9: Corrective Action						
Procedure 10: Records Management						
Procedure 11: EMS Audits						
Procedure 12: Management Reviews						
Procedures 13-X (list individually)						
EMS Audit Checklist						
Other plans & documents related to above procedures (list separately, e.g., SPCC Plan, Emergency Response Plan, etc.).						
Other forms and checklists (list)						

(Columns to be filled out with information such as the name of individual that revised document, his/her position/department, and dates(s) of revision.)

MODULE 11: OPERATIONAL CONTROL

Guidance and Tools

To function in line with your environmental policy, objectives, and targets, the operations and activities that are associated with significant environmental aspects (SEAs) must be under control. The facility must plan these activities, including maintenance, to ensure that they are carried out under specified conditions by establishing and maintaining documented procedures to cover situations where their absence could lead to deviations from the environmental policy (including the commitments to compliance and pollution prevention) or from your objectives and targets. These operational controls usually take the form of documented procedures, work instructions, best management practices, or posted placards.

For the SEAs for which you have established objectives and targets for improvement or study, the corresponding environmental management programs (EMPs) will serve as a form of operational control. What are left are SEAs for you to maintain compliance with legal requirements (or conformance with facility policy).

Most foundries already have the vast majority of the necessary compliance-related operational controls documented. Even so, the job of canvassing the entire facility and its operations to match existing procedures, work instructions, best management practices, and posted placards with the list of SEAs determined in *Module 4* is a crucial one. Likewise, there are two additional tasks associated with this module:

- Ensuring that the procedures you have are suitable and adequate; and
- Filling the gaps that you have identified where new procedures will be required.

Here is a set of steps to help you begin the process of developing your facility's operational control procedures.

Step 1: Operational controls are documented procedures that are associated with operations and activities that have identified SEAs. **Tool 11-1: Partial List of Typical Activity Areas and Operational Controls at a Foundry Facility** is an example of what a set of operational controls might include (for those indicated by an asterisk (*), examples are provided at the end of this module). Using **Tool 11-2: Linking SEAs to Operational Controls, Measurement Indicators, Job Functions, Responsible Parties, and Locations of Documents**, determine which of the necessary procedures and work instructions you already have in place as well as gaps where new procedures will need to be documented.

Step 2: Document operational control procedures for identified activities where controls are absent (see **Example 11-1: Operational Control for Container Labeling**, **Example 11-2: Operational Control for Hazardous Waste Satellite Accumulation Areas**, **Example 11-3: Operational Control for Empty Chemical Container Handling**, and **Example 11-4: Operational Control for New Material Purchasing**).

Step 3: Capture your approach for controlling the environmental aspects of on-site contractors and their sub-contractors in a written procedure. **Tools 11-3** and **11-4** provide a template. Include these customized procedures and templates in your EMS manual.

Step 4: Training needs associated with operational controls need to be identified, planned for, and tracked. Training needs associated with operational controls is addressed in *Module 8* on **Tool 8-3: Sample Training Needs Analysis Form**.

Tool 11-1: Partial List of Typical Activity Areas and Operational Controls at a Foundry Facility

Category of Activity	Operational Control
Purchase of Raw Materials	Sub-contractor Requirements New Material Purchasing*
Raw Material and Waste Storage and Handling	Waste Manifest/Chain of Custody Above Ground Tank Inspection Spill Reporting and Clean-up Secondary Containment Inspection Hazardous Waste Area Inspection Bulk Storage and Containment Bulk Liquids Transfer Containerized Material Storage Hazardous Waste Satellite Accumulation* Container Labeling* Empty Container Handling* Hazardous Waste Operations Procedure Control of Discharge and Disposal Waste Consolidation Guidelines
Shops and Facility Maintenance	Environmental Compliance Assessment Checklist Maintenance and Machine Shop Checklist Disposition of Fluorescent Bulbs, Batteries, and Mercury Items
Wastewater Management	Critical Ranges of Vital WWTP Operational Indicators Other Wastewater Plant SOPs
Air Quality Management	Tracking of SOx Emissions from Internal Combustion Engines Centralized Air Pollution Control SOPs Regulatory Reporting Calendar

Drafting Operational Controls

Use your answers to the following questions to begin planning documented procedures to cover operational activities and situations where their absence could lead to deviations from the environmental policy:

- Have we identified operations and activities associated with significant environmental aspects, legal requirements, and environmental objectives? If not, how will this be accomplished?
- Who should be involved?
- What operations and activities are associated with significant environmental aspects (and thereby legal requirements)?
- How are the above operations and activities controlled?
- How do we know whether these controls are adequate (i.e., to manage significant aspects, to ensure compliance, to achieve objectives)?
- How do we train employees and contractors on relevant operating controls?
- If new controls are needed (or existing ones need to be revised), what is our process for doing so? Who needs to be involved in this process?

The sample procedure provided in **Tool 11-3: Procedure for Contractors and Sub-contractors**, along with **Tool 11-4: Environmental Briefing Packet and Contractor Method Statement Template**, define the process for controlling the environmental aspects of on-site contractors and their sub-contractors, and can be customized to fit the needs of your facility.

It is useful to involve the people who will implement the procedures in drafting these controls. You can accomplish this in several ways:

- Meet with workers and have them describe current procedures. Discuss the environmental objective desired and obtain their input on operational controls (procedures) to ensure that the objectives will be met.
- Have someone (possibly an intern) interview the workers to establish current (undocumented) procedures, then draft or revise operational controls. Have the workers and a manager review the draft and incorporate their input.

Remember to keep written operational controls simple and concise. They should include the appropriate actions, precautions, and notifications required. Focus on activities that may lead to significant impacts and avoid getting overwhelmed by trying to control every activity and process.

Designate Responsibility for Maintaining and Reviewing Operational Controls

Designate those responsible for maintaining the controls and for reviewing them to ensure that procedures are followed and deviations are corrected. Generally, the workers responsible for the SEA under consideration will be responsible for implementing the associated operational controls. The immediate line manager would most likely be responsible for regular review of the controls. It is helpful to list those people responsible for each set of procedures. **Tool 11-2: Linking SEAs to Operational Controls, Measurement Indicators, Job Functions, Responsible Parties, and Locations of Documents** has a column for assigning operational control responsibilities.

Develop Operational Control-related Training

Achieving success in meeting environmental objectives for each SEA depends upon making sure that each person responsible for maintaining or reviewing controls has received adequate training. After operational controls are drafted, develop a training program that ensures that everyone understands the controls and their role in ensuring that they are followed. Training can include on-the-job training. **Tool 8-3: Sample Training Needs Analysis Form** in *Module 8* is provided to help your facility to determine training needs associated with operational controls. It should help you identify, plan for, and track the training needs of your employees. This information should be combined with general environmental training when creating an integrated training needs analysis for your EMS.

Take Corrective Action When Objectives Are Not Met

Take action to correct failures in operational controls as quickly as possible to meet environmental objectives. You can record corrections made on **Tools 14-3** and **14-4**, the sample corrective and preventive action tools included in *Module 14*.

Tool 11-2: Linking SEAs to Operational Controls, Measurement Indicators, Job Functions, Responsible Parties, and Locations of Documents

SEA	Objective & Target C=Control I=Improve S=Study	Measurement Indicators	Associated Job Functions/ Training Needs	Existing Operational Control (Procedure, Work Instruction, BMP, Visual Aid)	New Operational Control (Procedure, Work Instruction, BMP, Visual Aid)	Person Responsible	Production Processes								Material Loading, Unloading, Handling & Storage			Facilities & Maintenance			
							Inspection and Shipping	Cleaning, Finishing & Coating	Riser Cutoff & Gate Removal	Casting Shakeout	Mold Pouring & Cooling	Mold & Core Assembly	Core Forming and Curing	Sand & Binder Mixing	Raw Material Handling & Storage	Waste Storage & Separation	Waste Water Treatment Plant Operations	Centralized Air Pollution Control Operations	Cooling Water System	Boiler Operation	Administration

Contact Person: Date Complete:

Tool 11-3: Procedure for Contractors and Sub-contractors, Including Environmental Briefing Packet and Contractor Method Statement Template

1.0 Purpose/Scope

This procedure defines the process for controlling the environmental aspects of on-site contractors and their sub-contractors at the **[Facility's Name]**.

2.0 Activities Affected

All areas and departments authorizing contractors to work on-site.

3.0 Forms Used

Environmental Briefing Packet and Contractor Method Statement Template (**Tool 11-4**).

4.0 References

ISO 14001:1996, Element 4.4.6

5.0 Definitions

Method Statement: a written statement prepared by a contractor that outlines the work to be undertaken and the method(s) for minimizing and managing environmental impacts. The method statement includes an assessment of the environmental issues associated with specified work activities and measures necessary to minimize environmental impacts.

6.0 Exclusions

6.1 Contractor activities and services that are not performed at the facility.

6.2 Contractors performing emergency services.

6.3 Contractors providing clerical, accounting, or other similar administrative services.

7.0 Procedure

7.1 A Cross Functional Team led by the Environmental Management Representative (EMR) or designee develops a process to obtain and review contractor method statements.

7.2 The need for contractor services is identified and a request for a Method Statement is prepared by the initiating activity.

7.3 Information related to contractor on-site activities shall be documented by the contractor using a Contractor Method Statement.

7.4 Completed Contractor Method Statement forms will be submitted to the initiating activity. The EMR or designee will evaluate Method Statements to identify potential environmental issues and concerns.

7.5 Prior to on-site work contractors shall:

7.5.1 Be provided with information and documents to ensure their awareness of the **[Facility's Name]** EMS and their conformance to it.

7.5.2 Submit a completed Contractor Method Statement to the initiating activity.

7.6 While on site, contractors shall conform to the **[Facility's Name]** EMS and to all applicable legal and other requirements.

Contractors shall maintain records as specified by the EMS and by contract requirements.

8.0 General Rules

Contractors shall ensure their on-site staff is aware of **[Facility's Name]** requirements.

9.0 Records

Records shall be retained consistent with the Procedure for Environmental Records.

Record of Revisions

Revision Date	Description	Sections Affected

Tool 11-4: Environmental Briefing Packet and Contractor Method Statement Template

Introduction

The **[Facility's Name]** Environmental Management System is designed to meet the requirements of ISO 14001 Standard. The principle elements of the EMS and environmental policy are:

1. To establish and operate effective procedures aimed at controlling environmental performance to comply with all relevant environmental legislation and regulations;

2. To set objectives and targets aimed at achieving continual improvement in environmental performance; and

3. To introduce improvements that contribute to the prevention of the pollution at the source, where possible.

An important part of the EMS relates to the control of contractors and their sub-contractors, who are required to comply with **[Facility's Name]** environmental policies and procedures.

The nature of the contractor activities is such that contractor personnel have significant potential to affect the environmental performance and regulatory compliance of the facility. Contractor personnel and the facility must therefore work together to achieve the facility's environmental policy, the environmental objectives and targets, and the protection of the environment.

Contractors must be aware of the importance of compliance with relevant environmental legislation and regulations, and the consequences of non-compliance.

The contractor is responsible for developing a Contractor Method Statement and returning it to the **[Facility Name]** Environmental Management Representative or designee.

The contractor is responsible for communicating to all contractor personnel the information in their Method Statement as well as information from the Contractor Environmental Briefing Package.

Contractor Personnel Environmental Information

[Facility's Name] Environmental Management System

All contractors working at **[Facility's Name]** are required to comply with the requirements of the EMS and the environmental policy. This Environmental Guide provides general details of the Environmental Management System and Environmental Policy.

Environmental Management Basics—Contractors on-site

Contractors shall not allow discharges to drains and/or sewers without prior approval from the EMS Coordinator.

Contractors shall provide adequate spill/release prevention for all bulk materials.

Contractors shall immediately notify the **[Facility's Name]** Safety Committee Champion and the Project Manager of any spills, releases, or other environmental incidents.

Contractors shall immediately notify the EMS Coordinator and the Project Manager of any abnormal conditions found during excavation at the facility. Visibly discolored soils, soils with a discernible odor, and/or heavily stained concrete must not be removed from the site without prior approval of the EMS Coordinator.

Contractors shall properly label, store, and dispose of all waste materials generated from their activities per **[Facility's Name]** procedures or guidance.

If **[Facility's Name]** personnel are required to work with potentially hazardous materials brought on-site by a contractor, prior approval of the material by the EMS Coordinator is required.

Contractors must be sensitive to the effects of noise, odor, light, fugitive dust emissions, and traffic movement to the facility and the local community.

Contractors shall be required to prepare and maintain records pertaining to the work performed in accordance with environmental regulatory requirements, including record retention requirements.

Contractors shall ensure protection of the natural environment surrounding the work area.

Contractors shall ensure that all employees are properly trained on such things as the proper handling of material and equipment, proper response to incidents involving their material, and general information relating to the **[Facility's Name]** Environmental Management System.

Environmental Management System Documents

[Facility's Name] may wish to include or provide the following information prior to contractors/subcontractors beginning work:

- Environmental Policy;
- Index of Environmental Management System procedures; and

(Example)

Title of Procedure	ISO 14001 Element
Environmental Review for New Purchases, Processes, and Products	4.4.6

- Index of local procedures and work instruction.

(Example)

System Procedure/ Work Practice Number	Title	Issue Date

Contractor Method Statement

The contractor shall prepare and maintain information, including a clear method statement, regarding contractor/sub-contractor activities, which outlines the work to be undertaken and the method(s) for minimizing environmental impacts and maintaining compliance with environmental regulations.

Note: To assist in organizing and maintaining information, background information sections have been included (sections I, II, III). Sections can be modified or deleted as required when requesting a method statement from contractors.

[Facility's Name] Personnel To Complete Sections I, II, and III

Suppliers to Complete Sections IV, V, and VI

Section I. Your Information (type or print):

Name:	
Phone Number:	
Fax Number:	
Dept Name:	
Dept Number:	

Section II. Requisition Information (type or print):

Requisition Number:	
Project Number (if applicable):	

Section III. Service or Activity to be performed (check all that apply):

Material/Chemical (Production/Non-production)	**Paint** **Solvent** **Sealer**	**Treatment Chemicals** **Lubricants, Oils, Greases** **Gasoline**	**Janitorial/Maintenance** **Other (specify)** **Other (specify)**
Facilities/Construction:	**Electrical** **Paint** **Structural**	**Roofing** **Mechanical** **HVAC**	**General Contractor** **Arch/Engin/Consulting** **Other (specify)**
Industrial Services (Includes Environmental Services)	**Asbestos** **Lead** **Maintenance** **Janitorial**	**Emergency Response** **Env. Consulting** **Paint Booth Cleaning**	**Waste Management** **Other (specify)**
Containerization:	**5 Gal. or Less** **Drums** **Totes** **Bulk Tanks**	**Type of Contract:**	**Commodity Management** **On-site Manager Provided** **Total Cost Contract**

Section IV. Supplier/Contractor Information (Circle all that apply):

Current Supplier/Contractor to this Facility

New Supplier/Contractor to this Facility

Currently Involved in Other Facility Project(s)

List Project(s): _____

Complete Information in Table Below (type or print):

Name:	
Address:	
City:	
State:	
Phone Number:	
Fax Number:	
President/General Manager:	
Facility Site Coordinator:	
Email Address:	
Phone Number:	
Mobile Number:	
Fax Number:	
Pager:	
24-Hour Emergency Number:	

Sub-contractor Information (type or print):

Type	**Firm Name**
Architectural	
Mechanical	
Electrical	
HVAC	
Industrial Services	
Painting	
Roofing	
Asbestos	
Architectural/Engineering	
Consulting Firm	
Sampling/Testing	
Chemical Supplier	

Type	Firm Name
Other (specify)	
Scrap/Salvage Dealer	
Waste Disposal	
Demolition Disposal	

Note: It is strongly recommended that you have your subcontractors and suppliers involved at this facility complete a separate environmental briefing package for the facility's review.

Supplier/Contractor is financially responsible for on-site environmental remediation actions resulting from incidents involving their employees and subcontractors. To minimize the risk of environmental accidents please review and initial the items contained in the Environmental Management Basics table below:

Environmental Management Basics	Supplier/Contractor Initials
Supplier/Contractor understands the importance of compliance with relevant environmental legislation and regulations and the consequences of non-compliance.	
Suppliers/Contractors working at the facility are required to comply with and ensure that their employees and any Suppliers/Sub-Contractors or agents comply with the facility's Environmental Management System (EMS) and environmental policy.	
Suppliers/Contractors acknowledge receiving or were made aware of the facility's environmental policy as well as applicable system procedures and work practices.	
Suppliers/Contractors shall not discharge anything to drains and/or sewers without prior approval from the facility's EMS Coordinator. Spills and other releases to the environment must be immediately reported to the Safety Committee Champion.	
Suppliers/Contractors shall provide adequate spill release prevention, as approved by the facility's EMS Coordinator.	
Suppliers/Contractors shall immediately notify the facility's EMS Coordinator and the Project Manager of any abnormal conditions found during excavation activities at the facility.	
Suppliers/Contractors shall properly label, store, and dispose of all of their waste materials used on-site in accordance with facility procedures and all legal requirements.	
If facility personnel are required to work with potentially hazardous materials brought on-site by a contractor, prior approval of the material by the EMS Coordinator is required.	
Suppliers/Contractors shall minimize the effects of noise, odor, light, fugitive dust emissions, and traffic movement on and/or adjacent to facility property.	
Suppliers/Contractors shall obtain, prior to commencing work, all necessary environmental approvals or permits and present copies of such permits to the facility's EMS Coordinator.	
Suppliers/Contractors were informed of actions to be taken during an actual emergency situation.	
Suppliers/Contractors understand that the facility may interrupt Supplier/Contractor activities that violate facility policies and/or all legal requirements.	

Section V. Contractor Method Statement

Respond to the following questions (use additional space where required):

This method statement must be completed, signed, and returned to the facility's Environmental Management Representative before contracted work commences.

Work Description

Briefly describe the work to be performed while on-site, including the activities of each of the suppliers/contractors.

_____
_____
_____
_____
_____

Air Emissions

Will the work you perform produce or cause the release of any air emissions? YES NO

IF YES, list air emissions and method for preventing impact to the environment.

_____
_____
_____
_____
_____

Water Discharges

Will the work you perform produce or cause the release of any wastewater? YES NO

IF YES, how will the wastewater be handled?

_____
_____
_____
_____
_____

Materials

What materials (chemicals, oils, etc.) and/or equipment will you be handling or bringing on-site to perform the contracted work?

_____
_____
_____
_____
_____

Training

Your employees should be trained on the proper handling of materials and equipment, and the proper response to incidents involving these materials. Describe the training your employees receive.

_____
_____
_____
_____
_____

Waste Generation

Will the work you perform result in any wastes? YES NO

IF YES, list the disposal location as well as amounts and types of wastes expected and the proposed disposal method.

_____
_____
_____
_____
_____

Will any wastes generated be recyclable? YES NO

IF YES, list the recyclable and where and how they will be recycled.

_____
_____
_____
_____
_____

Energy

Will the work you perform consume energy (electricity, compressed air, natural gas, steam, etc.)? YES NO

IF YES, explain what type of energy will be consumed, and how you will minimize consumption.

_____
_____
_____
_____
_____

Other

Are there any other ways in which your work will be affecting and/or protecting the environment? YES NO

IF YES, please describe below.

_____
_____
_____
_____
_____

Other

Describe methods for minimizing waste, emissions, and energy usage from on-site.

_____
_____
_____
_____
_____

Other

Describe any environmental monitoring to be performed including sampling methods, frequency, analytical requirements, and laboratory to be used.

_____
_____
_____

Other

Identify environmental legal requirements applicable to the work that was not already addressed by the facility.

_____
_____
_____
_____
_____

Section VI. Supplier/Contractor Certification (review and sign):

I have reviewed and understand the information contained in this document. I also understand that **[Facility's Name]** Personnel have the right to inspect our activities and those of our Suppliers/Contractors with regards to our on-site activities. I further understand that activities pertaining to service and/or maintenance contracts may only require submission of this form on an annual basis. The facility's Environmental Management Representative should be contacted to make this determination.

Name _____

Title _____

Signature _____

Date _____

Examples

Example 11-1: Operational Control for Container Labeling, **Example 11-2: Operational Control for Hazardous Waste Satellite Accumulation Areas**, **Example 11-3: Operational Control for Empty Chemical Container Handling**, and **Example 11-4: Operational Control for New Material Purchasing** and their supporting checklists provide example operational control procedures. Revise these sample operational control procedures if you wish to use them. In revising them, it is crucial to review the requirements of your facility in accordance with company policies and the most recent federal, state, and local requirements.

Example 11-1: Operational Control for Container Labeling

1.0 Purpose

To maintain safety on-site and ensure that, in the event of a spill of a hazardous or non-hazardous substance, the Emergency Coordinator follows the correct procedure.

2.0 References

2.1 RCRA Subtitle C (40 CFR 262)

3.0 Responsibility

3.1 The Environmental Engineer or designee shall assure that **[Facility's Name]** makes available labels for container labeling and ensures that employees who handle and dispose of hazardous and non-hazardous wastes understand the labeling procedures outlined here.

3.2 Managers of each department are responsible for providing the Environmental Engineer with a list of employees who handle or may potentially handle hazardous and nonhazardous wastes.

4.0 Procedure for Labeling Containers

4.1 All containers of hazardous and non-hazardous substances should have a label. The label should include, at a minimum:

- 4.1.1 Chemical name
- 4.1.2 Hazard warning
- 4.1.3 Date
- 4.1.4 User department

4.2 All labels must be legible and written with a permanent marker.

4.3 Labels that have been damaged or removed must be replaced.

4.4 If a chemical is transferred to a portable or temporary container, then that container must also have a label.

4.5 If a chemical is flammable, an additional "DANGER/FLAMMABLE" label is required.

Approved by:

_____

Environmental Management Representative

Example 11-2: Operational Control for Hazardous Waste Satellite Accumulation Areas

1.0 Purpose

Maintain compliance with federal and state regulations for accumulating hazardous waste temporarily in various work areas at **[Facility's Name]**.

2.0 References

2.1 40 Code of Federal Regulations 261
2.2 40 Code of Federal Regulations 262
2.2 State Hazardous Waste Regulations (to be completed by each facility)

3.0 Definitions

3.1 Satellite Accumulation Area (SAA): an area within the facility at the point of generation that can have a maximum of 55-gallons of each type of hazardous waste generated at that location. Only one container of each type of waste may be used for accumulation in each designated SAA.
3.2 Accumulation Start Date: the date when a container stored in a SAA becomes full. The container must be moved from that location to the waste storage area within 2 days.
3.3 Full: for the purposes of this instruction, a container shall be considered to be full when waste has reached within 4-inches from the top of the container.

4.0 Responsibility

4.1 The EMS Coordinator is responsible for overall implementation and checking for implementation of this operational control procedure. The designated Production Supervisor for each production process is responsible for implementation of this procedure in his or her work area.
4.2 The Hazardous Waste Managers are responsible for implementation of steps defined below for their respective SAAs.
4.3 Employees that add waste to SAAs are responsible for the items described below for employees.

5.0 Procedure

5.1 SAAs shall be designated and tracked by the EMS Coordinator. The EMS Coordinator will maintain a map showing each SAA. The EMS Coordinator will maintain a list of all Hazardous Waste Managers.
5.2 Supervisors of areas that generate hazardous waste on a regular basis will have a Hazardous Waste Manager in their area. The Supervisor must notify the EMS Coordinator of any changes to Hazardous Waste Managers within his or her production area. The Supervisor also must notify the EMS Coordinator of the number of waste types and containers to be used in his or her SAA and of any requests for new SAAs or requests to modify an SAA.
5.3 Supervisors for areas that may generate hazardous waste on a one-time basis will coordinate with the EMS Coordinator to have the waste picked up in a timely manner. Waste should not be accumulated in these areas on a regular basis.
5.4 Each area that is designated as an SAA must comply with the following procedure.

5.4.1 Only one container for each defined type of hazardous waste is allowed in the SAA at any given time. The containers will be obtained from the EMS Coordinator and will be compatible with the waste they are to contain.

5.4.2 The container must have labels with the words "Hazardous Waste" on it before any waste can be added to the container. Labels are available from the EMS Coordinator. As an alternate, a marker or other means should be used to put these words on the accumulation container.

5.4.3 The label also must include a description of the type of waste in the container. The Environmental Manager will conduct any waste analysis and provide waste labels or waste labeling instructions for each waste.

5.4.4 The container will not be dated until the container is full (defined as having waste to within 4-inches from the top of the container).
When the container is full it will be dated. The Supervisor for each SAA is responsible for having the container moved to the hazardous waste storage area within 48 hours of it being filled and dated.

5.4.5 If a new container is needed when the existing container is full, the full one must be moved immediately to the storage area.

5.4.6 Hazardous Waste Managers should inspect their SAA area daily. These inspection records will be maintained by the SAA area in case of an inspection or internal audit. The Supervisor is responsible for making sure the inspection records are up-to-date for his or her SAA.

5.4.7 Each employee that adds waste to a container in an SAA should read the sign above the SAA area and make sure that the instructions are followed each time the container is accessed. For example, the waste is placed in the correct container, the container is closed after the addition of waste, etc. These checks do not need to be documented. The Supervisor is responsible for making sure that each employee knows to do this check and does them.

5.4.8 The EMS Coordinator will conduct a weekly inspection of all SAAs at this facility.

6.0 Records

6.1 The Hazardous Waste Managers will use the Weekly Hazardous Waste Satellite Storage Inspection Checklist to note that they have checked their area for the day. This form will be maintained at the SAA for which they are responsible.

6.2 The signs posted above each SAA document that employees conduct "each use" checks.

6.3 The EMS Coordinator will complete the Weekly Hazardous Waste Satellite Storage Inspection Checklist and maintain this checklist in the Environmental Office.

6.4 Training requirements for personnel supporting hazardous waste accumulation are documented under Training Operational Controls.

7.0 Revision—Date: March 2005

Approved by:

_____

Environmental Management Representative

Weekly Hazardous Waste Satellite Storage Inspection Checklist

Date: _____ Inspection Completed by: _____

Note: Inspect each of the following hazardous waste satellite storage areas on a weekly basis. Note any problem and record the corrective action taken to resolve the problem.

Inspect each area for the following:

(a) Condition of drums (leaking, bulging, rusting);
(b) Cleanliness of area;
(c) Drums or containers properly closed;
(d) Drums or containers properly labeled;
(e) Drums or containers dated when full; and
(f) Full drums or containers moved to the 90-day hazardous waste storage area within 48 hours.

Satellite Accumulation Sites

Satellite Accumulation Sites:	Good Condition	Needs Improvement
1.		
2.		
3.		
4.		
5.		
6.		

Example 11-3: Operational Control for Empty Chemical Container Handling

1.0 Purpose

This procedure outlines the method for handling empty chemical containers.

2.0 References

2.1 Standards Applicable to Generators of Hazardous Waste (40 CFR 262)
2.2 General Information, Regulations, and Definitions (49 CFR 171)
2.3 Hazardous materials table, special provisions, hazardous materials communications, emergency response information, and training requirements (49 CFR 172)
2.4 Shippers-general requirements for shipments and packagings (49 CFR 173)
2.5 **[Insert any state agency rules that apply]**

3.0 Responsibility

3.1 The Environmental Engineer or designee will ensure that employees at **[Facility's Name]** properly handle empty chemical containers.

4.0 Procedure for Handling Empty Chemical Containers

4.1 Containers that previously held hazardous materials are exempt from further regulation after certain conditions are met. Two of the most important conditions are that the containers are "empty" and properly managed.
4.2 If the container held a material that can be easily poured, then all material left in the container must be removed by any means, such as pumping, aspirating, or draining.
4.3 If the material is non-pourable, then all material that can be feasibly removed by physical means such as scraping or chipping must be removed.
4.4 If the container held an acute or extremely hazardous material or waste, the container shall be triple-rinsed using a cleaner capable of removing the material (must be done by a licensed facility).
4.5 The following is the normal practice for empty chemical container disposal.

Container Type	**General Disposal Method**
250- and 500-gallon totes	Returned to the vendor
55-gallon metal drums	Shipped to an approved scrap metal recycling facility
55-gallon plastic drums	Shipped to an approved plastic recycling facility
Less than 55-gallon metal	Place on pallets for incineration
Less than 55-gallon plastic	Place in normal trash container after emptying

Approved by:

_____

Environmental Management Representative

Example 11-4: Operational Control for New Material Purchasing

1.0 Purpose/Scope

This work instruction describes the procedures used to control the purchase and use of chemicals within **[Facility's Name]**. This procedure also aids in compliance with governmental environmental and health and safety regulations.

2.0 Responsibility

The Purchasing Department, with assistance from the Environmental Management Representative, is responsible for ensuring that only approved materials will be purchased. All employees are responsible for ensuring that only approved chemicals are used in the plant.

3.0 Procedure

3.1 The Purchasing Department maintains a list of approved materials. [**Link to list of approved materials.]**

3.2 Only those materials on the list of approved chemicals can be purchased and/or brought into the facility (this includes samples).

3.3 To approve a new material:

3.3.1 Complete the top portion of Form XXX – Chemical Approval Form. Submit the form and a copy of the Material Safety Data Sheet (MSDS) for the material to the Environmental Manager.

3.3.2 The Environmental Manager will evaluate the material based on the information provided and indicate if the material is approved or not on the bottom portion of the form.

3.3.3 If approved, the Environmental Manager will submit the form to the Purchasing Department. The Purchasing Department will add the material to the list of approved materials and file the form.

3.3.4 If not approved, the Environmental Manager will return one copy the form to the requester and file one copy of the form with the MSDS along with any other rejected substances.

3.4 Upon receipt of a shipment of materials/hazardous substances, the accompanying MSDS will be forwarded to the Environmental Manager. The Environmental Manager is responsible for maintaining MSDSs for all hazardous substances in the plant.

4.0 Reference

List of Approved Chemicals

5.0 Records

Completed Chemical Approval Forms--Form No. XXX

MODULE 12: EMERGENCY PREPAREDNESS AND RESPONSE

Guidance and Tools

Despite an organization's best efforts, the possibility of accidents and other emergency situations still exists. Effective **preparation and response** can reduce injuries, prevent or minimize environmental impacts, protect employees and neighbors, reduce asset losses, and minimize downtime. Section 4.4.7 of ISO 14001 requires organizations to establish and maintain procedures to identify and respond to emergency situations and to prevent and mitigate the environmental impacts that may be associated with them.

An effective emergency preparedness and response program should include provisions for:

- Assessing the potential for accidents and emergencies;
- Preventing incidents and their associated environmental impacts;
- Plans / procedures for responding to incidents;
- Periodic testing of emergency plans/procedures; and,
- Mitigating impacts associated with these incidents.

Consistent with the focus on continual improvement, it is important to **review** your emergency response performance **after an incident** has occurred. Use this review to determine if more training is needed or if emergency plans/procedures should be revised.

Useful information sources include, but are not limited to:

- Material safety data sheets;
- Plant layout;
- Process flow diagrams;
- Engineering drawings;
- Design codes and standards; and
- Specifications on safety systems (alarms, sprinklers, etc.).

Emergency Response is another area where you should not have to start from scratch. Several environmental and health and safety regulatory programs require emergency plans and/or procedures. First review what you have now and assess how well it satisfies the items discussed previously.

Make sure existing plans are controlled documents (are they dated and in accordance with your documentation procedures?)

Whether you are creating new or reviewing existing plans, keep the following in mind. Two planning components that many organizations overlook are how they **identify the potential for accidents** and emergencies and how they **mitigate the impacts** of such incidents. A cross-functional team (CFT) (with representatives from engineering, maintenance, and environmental health & safety, for example) can identify most potential emergencies by asking a series of "what if" questions related to hazardous materials, activities, and processes employed at the site. In addition to normal operations, the team should consider start-up and shutdown of process equipment, and other abnormal operating conditions.

Ask yourself: Does **everyone** (including new employees) know what to do in an emergency? How would contractors or site visitors know what to do in an emergency situation?

Communicate with **local officials** (fire department, hospital, etc.) about potential emergencies at your site and how they can support your response efforts.

Hints

- **Mock drills** can be an excellent way to reinforce training and get feedback on the effectiveness of your plans / procedures.
- **Post copies** of the plan (or at least critical contact names and phone numbers) around the site and especially in areas where high hazards exist. Include phone numbers for your on-site emergency coordinator, local fire department, local police, hospital, rescue squad, and others as appropriate.
- **Revise and improve your plan** as you learn from mock drills, training, or actual emergencies.

Checklist for Emergency Preparedness and Response Plans

Does your plan describe the following:

- ❑ Potential emergency situations (such as fires, explosions, spills or releases of hazardous materials, and natural disasters)?
- ❑ Hazardous materials used on-site (and their locations)?
- ❑ Key organizational responsibilities (including emergency coordinator)?
- ❑ Arrangements with local emergency support providers?
- ❑ Emergency response procedures, including emergency communication procedures?
- ❑ Locations and types of emergency response equipment?
- ❑ Maintenance of emergency response equipment?
- ❑ Training / testing of personnel, including the on-site emergency response team (if applicable)?
- ❑ Testing of alarm / public address systems?
- ❑ Evacuation routes and exits (map), and assembly points?

Tools 12-1 and **12-2** are worksheets to help your facility guide the process of ensuring that its emergency preparedness and response procedures are adequate and that they are well integrated into your EMS. **Tool 12-3** provides procedures for emergency preparedness and response.

Tool 12-1: Emergency Preparedness and Response Worksheet

Questions	Your Answers
Have we **reviewed our operations and activities** for potential emergency situations? If not, **how will this be accomplished**? Who should be **involved**?	
Do our existing emergency plans describe how we will **prevent** incidents and associated environmental impacts? If not, **how will this be accomplished**? Who should be **involved**?	
Have we **trained personnel** on their roles and responsibilities during emergencies?	
What **emergency equipment** do we maintain? How do we know that this equipment is adequate for our needs?	
How do **contractors and other visitors** know what to do in an emergency situation?	
When was our last emergency **drill**? Is there a plan / schedule for conducting future drills?	
Have we established a **feedback loop** so we can learn from our experiences?	
Our next step on emergency preparedness & response is to …	

Tool 12-2: Emergency Preparedness and Response Requirements Matrix

Potential Emergency Scenario	Potential Environmental Impact	Action Required	Procedures Needed	Training Needed

Tool 12-3: Procedures for Emergency Preparedness and Response

1.0 Purpose/Scope

This procedure defines the framework for preparing for and responding to emergencies involving potential environmental incidents at **[Facility's Name]**.

2.0 Procedure

2.1 Potential environmental incidents and emergencies likely to occur at the facility shall be identified semi-annually by the Cross Functional Team and documented in on the Emergency Preparedness and Response Requirements Matrix (**Tool 12-2**).

2.2 Methods to respond to, mitigate, and prevent environmental emergencies shall be established and maintained at the facility in the Security Office by the Emergency Response Coordinator.

2.3 Roles and responsibilities for communications within the facility and for obtaining outside support services shall be established and maintained at the facility via the emergency plans.

2.4 Mock drills or table-top exercises will be conducted at least annually. The EH&S Department shall maintain records of these tests. Methods to respond to, mitigate, and prevent environmental emergencies shall be amended as required based on the results of these tests.

2.5 Following an environmental emergency, the cause of the emergency and corresponding emergency methods shall be reviewed. Corrective/preventive actions will be identified and undertaken by implementing the Procedure for Corrective and Preventive Action. Methods to respond to, mitigate, and prevent releases that arise as a consequence of an environmental emergency shall be amended as required and the Environmental Management Representative or EMS Coordinator notified. Changes shall be documented.

2.6 Where applicable, regulatory agencies shall be notified by the EMS Coordinator of environmental incidents consistent with the Procedure for Communication with Stakeholders.

3.0 General Rules

All emergency response activities are to be conducted within boundaries of training levels, appropriate procedures, and governmental regulations.

The Facility Manager shall designate an Emergency Response Coordinator.

4.0 References

Procedure for Environmental Aspects, Objectives and Targets, and Programs

Procedure for Corrective and Preventive Action

Procedure for Communication with Stakeholders

ISO 14001:1996, Element 4.4.7

[Facility's Name] Emergency Preparedness and Response Plan

Procedure for internal and external notifications (i.e., contact, organization name, and phone number of facility emergency response coordinator, facility response team personnel, federal,

state, and local officials)

Procedure for establishment of a response management system

Procedure for preliminary assessment of the situation, including and identification of incident type, hazards involved, magnitude of the problem, and resources threatened

Procedure for establishment of objectives and priorities for response to the specific incident, including immediate goals/tactical planning (e.g., protection of workers and public as priorities), mitigating actions (e.g., discharge/release control, containment, and recovery, as appropriate) and identification of resources required for response

Procedure for implementation of tactical plan and mobilization of resources

Procedure for termination and follow-up actions

Procedure for incident documentation

Procedure for training and exercises/drills

Procedure for response critique and plan review and modification process

5.0 Records

Records are to be maintained as outlined in the procedure.

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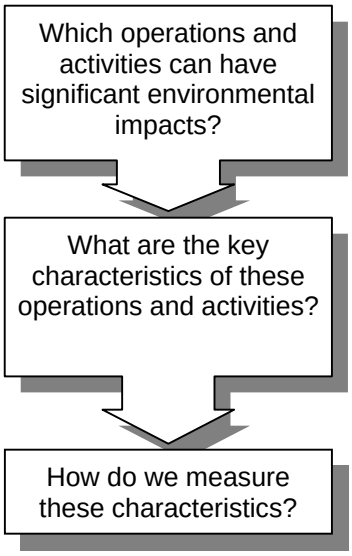
MODULE 13: MONITORING AND MEASUREMENT

Guidance and Tools

Section 4.5.1 of ISO 14001 requires organizations to establish procedures to monitor and measure **key characteristics** of their operations and activities that can have a significant impact on the environment.

Monitoring and measurement enables an organization to:

- Evaluate environmental performance;
- Analyze root causes of problems;
- Assess compliance with legal requirements;
- Identify areas requiring corrective action; and,
- Improve performance and increase efficiency.



In short, monitoring helps you manage your organization better. Pollution prevention and other strategic opportunities are identified more readily when current and reliable data are available.

Your organization should develop procedures to:

- Monitor and measure key characteristics of operations and activities that can have significant environmental impacts and/or compliance consequences;
- Track performance (including your progress in achieving objectives and targets);
- Calibrate and maintain monitoring equipment; and,
- Through internal audits, periodically evaluate your compliance with applicable laws and regulations.

Identifying Key Characteristics

Assemble your Cross Functional Team to decide what operations need to be monitored and/or measured in order to track progress towards meeting your objectives and targets. Record this information in the meeting minutes. Most effective environmental measurement systems use a combination of **process** and **outcome** measures. Outcome measures look at results of a process or activity, such as the amount of waste generated or the number of spills that took place. Process measures look at "upstream" factors, such as the amount of paint used per unit of product or the number of employees trained on a topic. Select a combination of process and

outcome measures that are right for your organization. Keep monitoring requirements limited to key process characteristics, and focus on the things that you can control.

Progress on Meeting Objectives

You should measure progress on achieving objectives and targets on a regular basis and communicate the results of such measurement to top management. To measure progress in meeting objectives, select appropriate performance indicators. Performance indicators can help you to understand how well your EMS is working. Start by identifying a few performance indicators that are:

- **Simple** and understandable;
- **Objective**;
- **Measurable**; and
- **Relevant** to what your organization is trying to achieve (i.e., its objectives and targets).

Data collected on performance indicators can be quite helpful during **management reviews** (see *Module 17*). So, select indicators that will provide top management with the information it needs to make decisions about the EMS.

Calibrating Equipment

A component of monitoring and measurement is equipment calibration. Your facility should identify process equipment and activities that truly affect your environmental performance. As a starting point, look at those **key process characteristics** you identified earlier. Some organizations place critical monitoring equipment under a special calibration and preventive maintenance program, or at least insure that they are part of the facility's regular PM program. This can help to ensure accurate monitoring and make employees aware of which instruments are most critical for environmental monitoring purposes. Some organizations find it is more cost-effective to subcontract calibration and maintenance of monitoring equipment than to perform these functions internally.

Regulatory Compliance

Determining your compliance status on a regular basis is very important. You should have a procedure to systematically **identify, correct, and prevent** violations. Effectiveness of the compliance assessment process should be considered during EMS **management review**.

Communicating Performance

People respond best to information that is meaningful to "their world." Putting environmental information in a form that is **relevant to their function** increases the likelihood they will act on the information. Be sure to link your measurement program with your **communications** program and other elements of the EMS (such as management reviews, as discussed later).

Documenting Your Monitoring and Measurement Process

Use your answers to the questions provided in **Tool 13-1** to guide your facility in establishing and implementing monitoring and measurement procedures. **Tool 13-2** is sample procedure that your facility can adopt for assuring environmental regulatory compliance. **Tool 13-3** is an example of a compliance tracking form to be used in association with the procedure. **Tool 13-4** is an example of documenting calibration measures.

- Monitoring and measuring can be a resource-intensive effort. One of the most important steps you can take is to clearly **define your needs**. While collecting meaningful information is clearly important, resist the urge to collect data "for data's sake."

- Review the kinds of monitoring you do now for **regulatory compliance** and other purposes (such as quality or health and safety management). How well might this serve your EMS purposes? What additional monitoring or measuring might be needed?

- Make measuring and monitoring reports applicable to the operational staff and meaningful for management.

- Monitoring and measurement procedures and work instructions should be incorporated into as many existing work instructions as possible. Delegate these revisions to supervisors or area managers.

- You can **start** with a **relatively simple** monitoring and measurement process, then build on it as you gain experience with your EMS.

Tool 13-1: Monitoring and Measurement Worksheet

Questions	Your Answers
Have we **identified operations and activities** associated with significant environmental aspects, legal requirements, and environmental objectives? If, not how will this be accomplished?	
What type(s) of monitoring and measurement do we need to ensure that **operational controls** are being implemented correctly?	
What type(s) of monitoring and measurement do we need to ensure that we are **complying** with **applicable legal requirements?**	
What type(s) of monitoring and measurement do we need to ensure that we are **achieving** our environmental **objectives & targets?**	
How do we identify the **equipment** used for any of the monitoring or measurement listed above?	
How will we ensure that monitoring and measurement equipment is properly **calibrated and maintained**?	
What process do we have to periodically **evaluate compliance with legal requirements**? How effective is this process?	
Our next step on monitoring and measurement is to …	

Tool 13-2: Sample Procedure for Monitoring and Measurement

1.0 Purpose

This procedure defines the mechanism for the monitoring and measurement of significant environmental aspects associated with **[Facility's Name]** operations and activities, the calibration and maintenance of monitoring equipment, and the evaluation of compliance with relevant environmental legal and policy requirements.

2.0 Procedure

2.1 Monitoring and Measurement of Significant Aspects, Objectives and Targets, and Operational Controls

2.2.1 The monitoring and measurement of key characteristics and environmental performance associated with significant aspects will be specified in environmental management programs and documented using Environmental Measurement Indicators Log.

2.2.2 The monitoring and measurement of conformance to specified environmental objectives and targets will be accomplished through the internal system audit process and through the creation of Corrective Action Requests.

2.2.3 Operational controls will be monitored and measured as indicated in applicable environmental management programs, procedures, work practices, or visual aids. The methods, frequencies and responsible parties for completing the monitoring and measuring activities will be specified in these documents, e.g., SOPs for Air and Wastewater Pollution Control Systems, O&M Procedures for Equipment and Pollution Control Systems, Title V Air, NPDES, and POTW Permits.

2.2 Calibration and Maintenance of Environmental Monitoring Equipment

2.2.1 Relevant areas and departments shall ensure that environmental monitoring equipment is calibrated and maintained at a frequency consistent with manufacturers' recommendations, or at least every year if those recommendations are unknown. Relevant areas and departments shall maintain calibration and maintenance records as necessary to prove conformance with this procedure.

2.2.2 Calibration and maintenance of environmental monitoring equipment shall be addressed in area and department preventative maintenance programs, where applicable, or in local work practices, if desired.

2.2.3 Each applicable area and department will maintain a list of EMS equipment requiring calibration and the corresponding calibration frequency using Calibration Log (**Tool 13-4**).

2.3 Evaluation of Compliance

The evaluation of compliance with relevant environmental legal requirements shall be accomplished through the implementation of Procedures for Environmental

Management System and Regulatory Compliance Audits. Document compliance monitoring activities using the Compliance Tracking Log (**Tool 13-3**).

3.0 Frequency

Ongoing.

4.0 Records

Compliance assessment results are recorded by the Cross Functional Team (CFT) using the compliance assessment protocol. Records are maintained by the EMS Coordinator.

Tool 13-3: Sample Form for Compliance Tracking

Person Responsible	Regulation	Root Cause	Compliance Check Date	Results	Corrective Action/Date	Compliance Verified/Date

Tool 13-4: Calibration Log

Indicator	Measurement Method	Equipment Used	Equipment calibrated: date/method
Contact Person:		Date Completed:	

Examples

An illustration of how monitoring and measurement is tied to the significant aspects, objectives and targets, and operational controls of facility's EMS is presented in **Example 13-1**. An illustration of how calibration needs are tied to significant aspects, operational controls, key characteristics of the operation, and monitoring and measurement methods is presented in **Example 13-2**.

Example 13-1: Example of Links Between Aspects, Objectives and Targets, Operational Controls, and Monitoring and Measurement

Significant Aspect	Objective	Target	Operational Control	Monitoring and Measurement
Air emissions from gas-fired smelters	C-Maintain compliance and S-Investigate potential for reduction	Ongoing	• Title V Permit • Centrifugal Collector O&M	• Pressure drop monitoring log • Compliance audit • Regulatory reporting • EMS audits
Solid waste from the sand system	S-Investigate potential for reduction	Complete study by January 2005	• Solid waste reduction EMP	• Waste reduction tracking metric • EMS audits

Example 13-2: Linking Monitoring Processes to Operational Controls

Operation with Significant Environmental Aspect	Operational Controls	Key Characteristics of Operation or Activity	Monitoring or Measurement Methods	Equipment Calibration Needs
Liquid Waste Storage *(significant aspect is potential for spills)*	• Generator procedure →	• Use of proper containers →	• Inspections of storage area →	• None
	→	• Segregation of incompatibles →	• Inspections of storage area →	• None
	• Storage area procedure →	• Availability of spill equipment →	• Inspections of storage area →	• None
New Chemical Purchasing *(significant aspect is waste generation)*	• Purchasing Approval procedure →	• EHS Manager approval of all new chemical purchases →	• Periodic review of Material Safety Data Sheets (MSDSs) • Inspections of chemical storage lockers →	• None

MODULE 14: NONCONFORMANCE AND CORRECTIVE AND PREVENTIVE ACTION

Guidance and Tools

Section 4.5.2 of ISO 14001 states that the organization shall establish and maintain procedures for defining responsibility and authority for handling and investigating nonconformance, taking corrective action to mitigate any impacts caused, and for initiating and completing corrective and preventive action.

No EMS is perfect. You will probably identify problems with your system (especially in the early phases) through audits, measurement, or other activities. In addition, your EMS will need to change as your organization changes and grows. To deal with system deficiencies, your organization needs a process to ensure that:

- Problems (including nonconformities) are identified and investigated;
- Root causes are identified;
- Corrective and preventive actions are identified and implemented; and
- Actions are tracked and their effectiveness is verified.

Key Steps

- ☑ Identify the problem
- ☑ Investigate to identify the root cause
- ☑ Come up with solution
- ☑ Implement solution
- ☑ Document solution
- ☑ Communicate solution
- ☑ Evaluate effectiveness of solution

EMS nonconformities and other system deficiencies (such as legal noncompliance) should be analyzed to detect patterns or trends. Identifying trends allows you to anticipate and prevent future problems.

Focus on correcting and preventing problems. Preventing problems is generally cheaper than fixing them after they occur (or after they reoccur). Start thinking about problems as opportunities to improve!

Why do EMS Problems Occur?

Typical causes include:

- ☑ Poor communication
- ☑ Faulty or missing procedures
- ☑ Equipment malfunction (or lack of maintenance)
- ☑ Lack of training
- ☑ Lack of understanding (of requirements)
- ☑ Failure to enforce rules
- ☑ Corrective actions fail to address root causes of problems

Determining Causes of Problems and Identifying Corrective Actions

You will need to establish a method to determine the causes of failing to meet a target. In some cases, the cause might not be difficult to understand. Other times, however, the cause might not be obvious. Make sure your actions are based on good information and analysis of causes. While many corrective actions may be "common sense," you need to look beneath the surface to determine why problems occur. Many organizations use the term "root cause" in their corrective and preventive action processes. While this term can be used to describe a very

formal analysis process, it can also mean something simpler – looking past the obvious or immediate reason for a nonconformance to determine why the nonconformance occurred.

Once you document a problem with respect to meeting targets, the company must be committed to resolving it. Take action as quickly as possible. First, make sure assigned responsibilities for actions and schedules are clear.

Employees in the shop may recognize the need for corrective action and provide good ideas for solving problems. Find ways to get them involved in the improvement process. It's important to determine whether a lapse is temporary or due to some flaw in the procedures or controls. For this reason, communicate any findings to employees, and provide any follow-up training for changes in the procedures that may result.

Here are some things to think about to expedite the determination of your facility's corrective and preventive action process:

- If your organization has an ISO 9001 management system, you should already have a corrective and preventive action process for quality purposes. Use this as a model (or integrate with it) for EMS purposes.

- Some organizations find that they can combine some elements of their management review and corrective action processes. These organizations use a portion of their management review meetings to review nonconformities, discuss causes and trends, identify corrective actions, and assign responsibilities.

- The amount of planning and documentation needed for corrective and preventive actions will vary with the severity of the problem and its potential environmental impacts. Don't go overboard with bureaucracy – simple methods often work quite effectively.

- Once you document a problem, the organization must be committed to resolving it in a timely manner. Be sure that your corrective and preventive action process specifies responsibilities and schedules for completion. Review your progress regularly and follow up to ensure that actions taken are effective.

- Rule of thumb: Corrective actions should (1) resolve the immediate problem, (2) consider whether the same or similar problems exist elsewhere in the organization, and (3) prevent the problem from recurring. The corrective action process also should define the responsibilities and schedules associated with these three steps.

- Initially, most EMS problems may be identified by your internal auditors. However, over the long run, many problems and good ideas may be identified by the people doing the work. This should be encouraged. Find ways to get employees involved in the system improvement process (for example, via suggestion boxes, contests, or incentive programs).

Use your answers to the questions provided in **Tool 14-1: Corrective and Preventive Action Worksheet** to guide your facility in establishing and implementing a corrective and preventive action program. **Tool 14-2: Sample Procedure for Corrective and Preventive Action** provides a sample procedure for conducting corrective and preventive action. Supporting **Tool**

14-3: Sample Corrective and Preventive Action Notice (CAPAN) can be used to document the use of your procedure. Supporting **Tool 14-4: Sample Corrective and Preventive Action Tracking Log** can be used to track corrective and preventive actions. **Sample Corrective and Preventive Action Notice (CAPAN)** could also be combined with the **Sample Form for EMS Audit Findings** (see **Tool 16-7** in *Module 16*).

Tool 14-1: Corrective and Preventive Action Worksheet

Questions	Your Answers
Do we have an **existing process** for corrective and preventive action? If yes, does that process need to be revised? In what way?	
Who needs to be involved in this process within our organization?	
How are **nonconformities** and other potential system deficiencies **identified**? (List methods such as audits, employee suggestions, ongoing monitoring, etc.)	
How do we **determine the causes** of nonconformities and other system deficiencies? How is this information used?	
How do we **track the status** of our corrective and preventive actions?	
How is/can **information** on nonconformities and corrective actions **be used within the EMS** (for example, in management review meetings, in employee training sessions, in review of procedures, etc.)?	
How do we **ensure the effectiveness** of our corrective and preventive actions?	
Our next step on corrective and preventive action is to …	

Tool 14-2: Sample Procedure for Corrective and Preventive Action

1.0 Purpose

The purpose of this procedure is to establish and outline the process for identifying, documenting, analyzing, and implementing preventive and corrective actions.

2.0 Scope

Preventive or corrective actions may be initiated using this procedure for any environmental problem affecting the organization.

3.0 General

3.1 Corrective action is generally a reactive process used to address problems after they have occurred. Corrective action is initiated using **Tool 14-3: Sample Corrective and Preventive Action Notice (CAPAN)**, as the primary vehicle for communication. Corrective action may be triggered by a variety of events, including internal audits and management reviews. Other items that might result in a CAPAN include neighbor complaints or results of monitoring and measurement.

3.2 Preventive action is generally a proactive process intended to prevent potential problems before they occur or become more severe. Preventive action also is initiated using the CAPAN. Preventive action focuses on identifying negative trends and addressing them before they become significant. Events that might trigger a CAPAN include monitoring and measurement, trends analysis, tracking of progress on achieving objectives and targets, response to emergencies and near misses, and customer or neighbor complaints, among other events.

3.3 CAPANs are prepared, managed, and tracked using the preventive and corrective action database.

3.4 The EMR (or designee) is responsible for reviewing issues affecting the EMS, the application and maintenance of this procedure, and any updates to EMS documents affected by the preventive and corrective actions.

3.5 The EMR is responsible for logging the CAPAN into the database, and tracking and recording submission of solutions in the database. The requester and recipient of the CAPAN are responsible for verifying the effectiveness of the solution. The EMR is responsible for overall tracking and reporting on preventive and corrective actions.

3.6 Personnel receiving CAPANs are responsible for instituting the required corrective or preventive action, reporting completion of the required action to the EMR, and assuring sustained effectiveness.

3.7 Completed records of CAPANs are maintained in the database for at least two years after completion of the corrective or preventive action.

4.0 Procedure

4.1 Issuing a CAPAN

4.1.1 Any employee may request a CAPAN. The employee requesting the CAPAN is responsible for bringing the problem to the attention of the EMR.

The EMR is responsible for determining whether a CAPAN is appropriate and enters the appropriate information into the corrective and preventive action database. Responsibility for resolving the problem is assigned to a specific individual ("the recipient").

4.1.2 The EMR, working with the recipient, determines an appropriate due date for resolving the CAPAN.

4.2 Determining and Implementing Corrective and Preventive Actions

4.2.1 The CAPAN is issued to the recipient, who is responsible for investigation and resolution of the problem. The recipient is also responsible for communicating the corrective or preventive action taken.

4.2.2 If the recipient cannot resolve the problem by the specified due date, he / she is responsible for determining an acceptable alternate due date with the EMR.

4.3 Tracking CAPANs

4.3.1 Close-out of CAPAN's should be tracked by the EMR or his designee using **Tool 14-4: Sample Corrective and Preventive Action Tracking Log**. CAPANs whose resolution dates are overdue appear on the Overdue Solutions report. The EMR is responsible for issuing this report on a weekly basis to the Plant Manager and the recipients of any overdue CAPANs.

4.3.2 Records of CAPANs are maintained in the database for at least two years after completion of the corrective or preventive action.

4.4 Tracking Effectiveness of Solutions

The recipient of a CAPAN, in conjunction with the requester, are responsible for verifying the effectiveness of the solution. If the solution is deemed not effective, the CAPAN will be reissued to the original recipient.

Tool 14-3: Sample Corrective and Preventive Action Notice (CAPAN)

Issue Date:	Solution Due Date:
Requested by: Issued to:	
Problem Statement:	
Most Likely Causes:	
Suggested Solutions/Preventions:	
Action Taken:	
Measured Results:	
Corrective and Preventive Action Closed by:	Date:
Contact for Notice:	Date Completed:

Tool 14-4: Sample Corrective and Preventive Action Tracking Log

CAPAN Number	Requested By	Issued To	Plan Due (Date)	Plan Completed (Date)	Corrective and Preventive Action Completed (Date)	Effectiveness Verified (Date)	CAPAN Closed (Date)

MODULE 15: RECORDS

Guidance and Tools

Section 4.5.3 of ISO 14001 requires organizations to identify and maintain necessary environmental records. Records provide evidence that the processes that make up your EMS are being implemented as described. The purpose of records management is fairly simple – you should be able to **demonstrate** that your organization is actually implementing the EMS as designed. While records have value internally, over time you may need to provide **evidence of EMS implementation to external parties** (such as customers, a registrar, or the public). Records management is sometimes seen as bureaucratic, but it is difficult to imagine a system **operating consistently** without accurate records.

The basics of records management are straightforward: you need to decide **what** records you will keep, **how** you will keep them and for **how long**. You should also think about how you will **dispose** of records once you no longer need them.

If your organization has an ISO 9001 (or other) management system, you should have a process in place for managing records. This process could be adapted for EMS purposes.

- Start by **identifying** what **EMS records are required**. Review the procedures and work instructions you have developed for your EMS to determine **what evidence is needed to demonstrate implementation**. Also consider records that are required by various **legal requirements**.

- **Focus on records that add value –** avoid bureaucracy. If records have no value or are not specifically required, don't collect them. The records you choose to keep should be **accurate and complete**.

- You may need to generate certain **forms** in order to implement your EMS. When these forms are filled out, they become records. Forms should be **simple and understandable** for the users.

- Establish a records retention policy and stick to it. Make sure that your policy takes into account **records retention requirements specified in applicable environmental regulations**.

- If your organization uses computers extensively, consider using an electronic EMS records management system. Maintaining records electronically can provide an excellent means for rapid retrieval of records as well as controlling access to sensitive records.

- Identify which records, if any, might require additional security. Do you need to restrict access to certain records? Should a back-up copy of critical records be maintained at another location?

Key Questions

- ☑ What records are kept?
- ☑ Who keeps them?
- ☑ Where are they kept?
- ☑ How are they kept?
- ☑ How long are they kept?
- ☑ How/when are they accessed?
- ☑ How are they disposed?

Types of records you might maintain include the following:

- Legal, regulatory, and other code requirements;
- Results of environmental aspects identification;
- Reports of progress towards meeting objectives and targets;
- Permits, licenses, and other approvals;
- Job descriptions and performance evaluations;
- Training records;
- EMS audit and regulatory compliance audit reports;
- Reports of identified nonconformities, corrective action;
- Plans, and corrective action tracking data;
- Hazardous material spill / other incident reports;
- Communications with customers, suppliers, contractors, and other external parties;
- Results of management reviews;
- Sampling and monitoring data;
- Maintenance records; and
- Equipment calibration records.

Tool 15-1 is a worksheet to guide your facility in setting up an effective record-keeping system. **Tool 15-2** is a checklist of some of the key records necessary to support your EMS. There will be other records you will need to demonstrate performance of your EMS, but those in **Tool 15-2** are specific to the system operation. A **Sample Procedure for Environmental Records** is proved as **Tool 15-3**, along with accompanying **Tool 15-4**, **Index of Environmental Records**.

Tool 15-1: Records Management Worksheet

Questions	Your Answers
Have we **identified what records** need to be maintained? Where is this defined?	
Have we determined records **retention times**? Where is this defined?	
Have we established an effective **storage and retrieval** system?	
Our next step on records is to …	

Tool 15-2: Sample Checklist for Records of Supporting Documentation

_____ Facility organization chart

_____ Facility environmental policy and standards

_____ Staffing and organization chart for your facility

_____ Supporting documentation for reporting and communication networks such as meeting notices, meeting minutes, memoranda, etc.

_____ Written environmental program performance and status reports

_____ Facility-specific environmental policies and procedures

Tool 15-3: Sample Procedure for Environmental Records

1.0 Purpose/Scope

This procedure identifies the management of environmental records at the **[Facility's Name]**.

2.0 Procedure

- Records shall be maintained and retained as specified in the Index of Environmental Records (**Tool 15-4**).
- Record retention will be consistent with applicable legal and other requirements.
- Each area or department manager or designee shall have access to a master list of all EMS records relevant to their area or department, as applicable.
- Each employee responsible for maintaining a record has the responsibility for establishing the method for filing and indexing records to ensure accessibility**.**

3.0 Frequency

Ongoing.

4.0 Records

Records shall be retained as specified in this procedure.

Tool 15-4: Index of Environmental Records

Document #	Record Title	Retention (yrs)	Controlled By	Location

Examples

Example 15-1 provides a sample file organization for environmental records, while **Example 15-2** is a sample EMS records management table.

Example 15-1: Sample of Environmental Records File Organization

Air Emissions Regulations
Air Emissions Fees
Air Emissions Inventories
Air Emissions Permits
Air Permit Applications
Air Permit(s): Historical
Annual Licenses & Fees
Compliance Reporting
Compliance Plans
Community Right-to-Know
EPCRA Regulations
EPCRA Reporting
Hazardous Waste Regulations
Hazardous Waste Permit/ID Number
Hazardous Waste Fees
Hazardous Waste Biennial Report
Hazardous Waste: Open Manifests
Hazardous Waste: Closed Manifests
Historical Data
Indoor Air Quality
Loss Prevention Information
Other Permits & Permit Applications
Pollution Prevention (P2) Regulations
Pollution Prevention Fees
Pollution Prevention Reporting
Recycling Information
Recycling Projects
Special Wastes
Solid Waste Permit
Solid Waste Fees
Spill Reports
Spill Response Actions
Storm Water Regulations
Storm Water Permit
VOC/HAPs Reporting
VOC Annual Analysis
Wastewater Regulations
Wastewater Fees
Wastewater Permit
Wastewater: Semi-Annual Reporting

Example 15-2: Sample EMS Records Management Table

Title: EMS RECORDS MANAGEMENT TABLE	**Doc. No.:** EMF-4.5.3
Revision Date: November 7, 2000	**Approval by:**
Print Date: May 5, 2004 (Uncontrolled document if printed)	**Page 1 of 2**

EMS Records Management Table

The following table lists records related to the Environmental Management System, in accordance with EMP and Section 4.5.3 of ISO 14001.

Record Type	Person Responsible	Location	File Method	Retention Minimum
ADMINISTRATION				
Records on costs - purchasing, operations, and disposal	Office Manager	Admin. Office	Date order	3 years
Utility bills	Office Manager	Admin. Office	Date order	3 years
Record of annual waste quantity received	Office Manager	Admin. Office	Date order	Life of company
Certificates of Insurance	Office Manager	Admin. Office	Date order	Life of company
Waste analysis sheets	Office Manager	Admin. Office	Customer name	3 years
Waste manifests - outgoing	Office Manager	Admin. Office	Date order	3 years
ENVIRONMENTAL				
Incident reports	Env. Dept.	Env. Office	Date order	3 years
Complaint reports	Env. Dept.	Env. Office	Date order	3 years
EMS communications with external parties	Env. Dept.	Env. Office	Issue	3 years
Decision regarding external communication of significant environmental aspects	Env. Dept.	Env. Office	Date order	3 years

Record Type	Person Responsible	Location	File Method	Retention Minimum
Major source determination records	Env. Dept.	Env. Office	Date order	Life of company
Title V permit exemption	Env. Dept.	Env. Office	Date order	Life of company
Correspondence regarding air notices	Env. Dept.	Env. Office	Date order	5 years
Odor control system permit	Env. Dept.	Env. Office	Date order	5 years or per permit
Air emission reports	Env. Dept.	Env. Office	Date order	5 years
Records on waste disposal sites used	Env. Dept.	Env. Office	Site name	Life of company
EMS monitoring inspection reports	Env. Dept.	Env. Office	Date order	5 years

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MODULE 16: EMS AUDITS

Guidance and Tools

Once your organization has established its EMS, verifying the implementation of the system will be critical. To identify and resolve EMS deficiencies you must **actively seek them out**.

In a smaller organization, periodic audits can be particularly valuable. Managers are often so close to the work performed that they may not see problems or bad habits that have developed. Periodic EMS audits will help determine whether **all** of the requirements of the EMS are being carried out **in the specified manner**.

For your EMS audit program to be effective, you should:

- Develop audit procedures and protocols;
- Determine an appropriate audit **frequency**;
- Select and **train** your auditors; and
- Maintain audit **records.**

Results of your EMS audits should be linked to the **corrective** and **preventive action** process, as described earlier.

Audit Procedures Should Describe:

- ☑ Audit planning
- ☑ Audit scope (areas and activities covered)
- ☑ Audit frequency
- ☑ Audit methods
- ☑ Key responsibilities
- ☑ Reporting mechanisms
- ☑ Recordkeeping

While they can be time-consuming, EMS audits are critical to EMS effectiveness. Systematic identification and reporting of EMS deficiencies to management provides a great opportunity to:

- Maintain **management focus** on the environment,
- **Improve** the EMS and its performance, and
- Ensure the system's **cost-effectiveness**.

How Frequently Do We Need to Audit?

To determine an appropriate frequency of your EMS audits, consider the following factors:

- The nature of your **operations** and **activities**,
- Your significant environmental **aspects / impacts** (which you identified earlier),
- The results of your **monitoring** processes, and
- The results of **previous audits**.

It is recommended that all parts of the EMS should be audited **at least annually**. You can audit the entire EMS at one time or break it down into discrete elements for more frequent audits.

Regularly revisiting your environmental aspects and objectives is an essential step in developing an EMS that achieves the goal of continuous environmental improvements. The regular review of aspects can be used to change the priorities already established, or to examine activities that were set aside. The regular review can be part of a planned "phasing in" process, wherein different parts of your company's operations are reviewed until all your company's activities are included in your EMS. The regular review of aspects is the foundation for your company's continuing improvement.

What Do We Need to Audit?

As part of your audits, it is critical that you regularly review your company's environmental aspects and objectives. Over time, you will probably add to the list of environmental aspects and you may need to re-rank the aspects as your activities change and as new information becomes available. Here are some things to check:

- New process review – have any changes introduced new environmental aspects?
- Worksheets from the most recent environmental aspect identification and ranking exercises – is there new information on chemical effects? If so, update your worksheets.
- Communication received from stakeholders – do any comments suggest a need for re-ranking your aspects?
- Environmental objectives and targets – what new ones will your company set for this time period?
- Pollution prevention program – has information become available from this effort that would add aspects or objectives?
- Audit program – have your audits turned up information on where your EMS and environmental programs could be improved? Would this information be useful in your aspect identification process or in redesigning your objectives?

Who Will Perform the Audits?

You should select and train EMS auditors. Auditor training should be both **initial and ongoing**. Commercial EMS auditor training is available, but it might be more cost-effective to link up with businesses or other organizations in your area. Contact NADCA for assistance in this area.

Auditors should be trained in **auditing techniques** and **management system** concepts. Familiarity with environmental regulations, facility operations, and environmental science can be a big plus, and in some cases may be essential to adequately assess the EMS.

Some auditor training can be obtained **on-the-job**. Your organization's first few EMS audits can be considered part of auditor training, but make sure that an **experienced auditor** leads or takes part in those "training" audits.

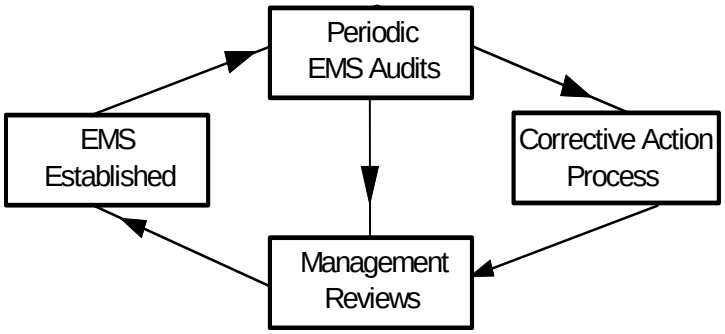
Auditors should be **independent of the activities being audited**. This can be a challenge for small organizations.

If your company is registered under ISO 9001, consider using your internal quality auditors as EMS auditors. While some additional training might be needed for EMS auditing, many of the required skills are the same.

How Should Management Use Audit Results?

Management can use EMS audit results to **identify trends or patterns** in EMS deficiencies. The organization also should ensure that identified system gaps or deficiencies are **corrected** in a timely fashion and that corrective actions are **documented**.

Linkages Among EMS Audits, Corrective Action and Management Reviews



- Your EMS audits should focus on **objective evidence of conformance**. During an audit, auditors should resist the temptation to evaluate, for example, **why** a procedure was not followed – that step comes later.

- During an audit, auditors should **review identified deficiencies** with people who work in the relevant area(s). This will help the auditors verify that their audit findings are correct. This also can reinforce employee awareness of EMS requirements.

- If possible, train at least **two** people as internal auditors. This will allow your auditors to work as a **team**. It also allows audits to take place when one auditor has a schedule conflict, which is often unavoidable in a smaller organization!

- **Before you start** an audit, be sure to **communicate** the audit scope, criteria, schedule, and other pertinent information to the people in the affected area(s). This helps to avoid confusion and facilitate the audit process.

- Consider **integrating** your EMS and regulatory compliance audit processes, **but** keep in mind that these audit processes have different purposes. While you might want to **communicate the results** of EMS audits widely within your organization, the results of compliance audits might need to be communicated in a more limited fashion.

- Final thought: An EMS audit **is** a check on how well your system meets your established EMS requirements. An EMS audit **is not** an audit of how well employees do their jobs. In addition, audits should be judged on the **quality** of findings, rather than on the number of findings.

Tool 16-1 is a worksheet that will guide your facility in establishing and implementing an EMS audit program. **Tool 16-2** provides a sample procedure for conducting internal EMS audits. **Tools 16-3, 16-4, 16-5, 16-6**, and **16-7** are sample forms that can be used to document planning, implementation, reporting, and follow-up associated with your internal EMS audits.

Tool 16-1: EMS Auditing Worksheet

Questions	Your Answers
Have we developed an **EMS audit program**? If not, how will this be accomplished? **Who need to be involved** in the audit process?	
Is there **another audit program** with which our EMS audits could be **linked** (for example, our quality or health & safety management system audits)?	
Have we determined an appropriate **audit frequency**? What is the **basis** for the existing frequency? Should the frequency of audits be modified?	
Have we **selected** EMS auditors? What are the **qualifications** of our auditors?	
What **training** has been conducted or is planned for our EMS auditors?	
Have we **conducted EMS audits** as described in the audit program? Where are the results of such audits described?	
How are the results of EMS audits **communicated** to top management?	
How are the **records** of these audits maintained?	
Our next step on EMS auditing is to …	

Tool 16-2: Sample Procedure for EMS Audits

1.0 Purpose

To define the process for conducting periodic audits of the environmental management system (EMS). The procedure defines the process for scheduling, conducting, and reporting of EMS audits.

2.0 Scope

This procedure applies to all internal EMS audits conducted at the site.

The scope of EMS audits may cover all activities and processes comprising the EMS or selected elements thereof.

3.0 General

3.1 Internal EMS audits help to ensure the proper implementation and maintenance of the EMS by verifying that activities conform with documented procedures and that corrective actions are undertaken and are effective.

3.2 All audits are conducted by trained auditors. Auditor training is defined by Procedure [to be developed by the facility]. Records of auditor training are maintained in accordance with the **Sample Procedure for Environmental Records (Tool 15-3)**.

3.3 When a candidate for EMS auditor is assigned to an audit team, the Lead Auditor will prepare an evaluation of the candidate auditor's performance following the audit.

3.4 The Environmental Management Representative (EMR) is responsible for maintaining EMS audit records, including a list of trained auditors, auditor training records, audit schedules and protocols, and audit reports.

3.5 EMS audits are scheduled to ensure that all EMS elements and plant functions are audited at least once each year. **Sample Audit Plan Form (Tool 16-3)** shall be used to document the facility's audit plan.

3.6 The EMR is responsible for notifying EMS auditors of any upcoming audits a reasonable time prior to the scheduled audit date. Plant areas and functions subject to the EMS audit will also be notified a reasonable time prior to the audit. **Tool 16-4** shall be used to communicate with the facility's EMS audit team.

3.7 The Lead Auditor is responsible for ensuring that the audit, audit report and any feedback to the plant areas or functions covered by the audit is completed per the audit schedule. **Tools 16-5** and **16-6** shall be submitted to the EMR in conjunction with the audit report.

3.8 The EMR, in conjunction with the Lead Auditor, is responsible for ensuring that **Sample Form for EMS Audit Findings (Tool 16-7)** are prepared for audit findings, as appropriate.

4.0 Procedure

4.1 Audit Team Selection - One or more auditors comprise an audit team. When the team consists of more than one auditor, a Lead Auditor will be designated. The Lead Auditor is responsible for audit team orientation, coordinating the audit process, and coordinating the preparation of the audit report.

4.2 Audit Team Orientation - The Lead Auditor will assure that the team is adequately prepared to initiate the audit. Pertinent policies, procedures, standards, regulatory requirements and prior audit reports are made available for review by the audit team. Each auditor will have appropriate audit training.

4.3 Written Audit Plan - The Lead Auditor is responsible for ensuring the preparation of a written plan for the audit. The **Sample Form for Internal Assessment Checklist (Tool 16-5)** may be used as a guide for this plan.

4.4 Prior Notification - The plant areas and / or functions to be audited are to be notified a reasonable time prior to the audit.

4.5 Conducting the Audit

4.5.1 A pre-audit conference is held with appropriate personnel to review the scope, plan and schedule for the audit.

4.5.2 Auditors are at liberty to modify the audit scope and plan if conditions warrant.

4.5.3 Objective evidence is examined to verify conformance to EMS requirements, including operating procedures. All audit findings must be documented.

4.5.4 Specific attention is given to corrective actions for audit findings from previous audits.

4.5.5 A post-audit conference is held to present audit findings, clarify any misunderstandings, and summarize the audit results.

4.6 Reporting Audit Results

4.6.1 The Team Leader prepares the audit report, which summarizes the audit scope, identifies the audit team, describes sources of evidence used, and summarizes the audit results.

4.6.2 Findings requiring corrective action are entered into the corrective action database.

4.7 Audit Report Distribution

4.7.1 The EMR is responsible for communicating the audit results to responsible area and / or functional management. Copies of the audit report are made available by the EMR.

4.7.2 The EMR is responsible for ensuring availability of audit reports for purposes of the annual management review.

4.8 Audit Follow-up

4.8.1 Management in the affected areas and / or functions is responsible for any follow-up actions needed as a result of the audit.

4.8.2 The EMR is responsible for tracking the completion and effectiveness of corrective actions.

4.9 Recordkeeping

Audit reports are retained for at least two years from the date of audit completion. The EMR is responsible for maintaining such records.

Tool 16-3: Sample Audit Plan Form

Area or Function to be Audited	Lead Auditor	Audit Team Members	Target Date	Special Instructions

Tool 16-4: Sample Form for Communications to Audit Team

ENVIRONMENTAL MANAGEMENT SYSTEM AUDIT

Lead Auditor: _____

Audit Team Members: _____

_____

Audit Area: _____ Target Due Date: _____

Listed above is the area to be audited. The due date given is the target to have the entire audit completed, including the report and follow-up meeting with the responsible area management. Listed below are the areas of environmental management systems criteria that you are to assess. If you have any questions, please call me. Special instructions, if any, are listed below. Thank you for your help. Effective audits help make an effective environmental management system.

__ Policy

__ Environmental Aspect identification

__ Environmental Management Program

__ Training, Awareness, Competence

__ EMS Documentation

__ Operational Controls

__ Monitoring and Measurement

__ Records

__ Management Review

__ Legal and Other Requirements

__ Objectives and Targets

__ Structure and Responsibility

__ Communication

__ Document Control

__ Emergency Preparedness

__ Nonconformance / Corrective Action

__ Management System Audits

Special Instructions: _____

_____

_____

EMR (signature) _____

Tool 16-5: Sample Form for Internal Assessment Checklist

Internal Assessment Team: _____

Date of Internal Assessment: _____

Signed: _____

EMS Procedures

Check each item assessed (includes auditing of records, where applicable):

__ Environmental policy (adherence to policy commitments)
__ Environmental objectives (progress; implementation of action plans)
__ EMS responsibilities
__ Identification of Environmental Aspects
__ Identification of Legal Requirements
__ Identification of Significant Environmental Aspects
__ Development of Objectives, Targets, and Action Plans
__ Conducting an Alternatives Evaluation
__ Development of Operational Controls
__ Environmental Training (Awareness and Task-Specific)
__ Emergency Preparedness
__ Review of New Products and Processes
__ Documentation
__ Conducting a Compliance Assessment
__ Conducting an Internal Assessment
__ Taking Corrective Action
__ Management Review

EMS Performance

__ Achieved objective #1
__ Achieved objective #2
__ Achieved objective #3

Contact Person: _____ Date Completed: _____

Tool 16-6: Sample EMS Audit Summary Form

EMS AUDIT SUMMARY SHEET

Organization Audited: _____

Lead Auditor: _____ **Date:** _____

ELEMENT NUMBER AND DESCRIPTION		AUDIT RESULTS	
		No. of Majors / No. of Minors	**A, N, or X***
4.2	Environmental Policy		
4.3	*Planning*		
4.3.1	Environmental Aspects		
4.3.2	Legal and Other Requirements		
4.3.3	Objectives and Targets		
4.3.4	Environmental Management Program(s)		
4.4	*Implementation and Operation*		
4.4.1	Structure and Responsibility		
4.4.2	Training, Awareness, and Competence		
4.4.3	Communication		
4.4.4	EMS Documentation		
4.4.5	Document Control		
4.4.6	Operational Control		
4.4.7	Emergency Preparedness and Response		
4.5	*Checking and Corrective Action*		
4.5.1	Monitoring and Measurement		
4.5.2	Corrective and Preventive Action		
4.5.3	Records		
4.5.4	EMS Audit		
4.6	Management Review		
TOTAL			
Legend: A = Acceptable: Interviews and other objective evidence indicate that the EMS meets all the requirements of that section of the standard.		N = Not Acceptable: The auditor has made the judgment that, based on the number and type of nonconformances, the requirements of that section of the EMS are not being met. X = Not Audited	

Tool 16-7: Sample Form for EMS Audit Findings

EMS AUDIT FINDINGS FORM

Type of Finding (circle one):

Nonconformance: Major Minor Positive Practice Recommendation

Description (include where in the organization the finding was identified):

_____
_____
_____
_____
_____
_____

EMS 14001 (or other EMS criteria) Reference: _____	**Date:** _____	**Finding Number:** _____
Auditor: _____	**Auditee's Rep.:** _____	

Corrective Action Plan (including time frames):

_____
_____
_____
_____
_____
_____

Preventive Action Taken:

_____
_____
_____

Individual Responsible for Completion of the Corrective Action: _____	**Date Corrective Action Completed:** _____

Corrective Action Verified By:

_____ **Date**: _____

Examples

Examples 16-1 and **16-2** are sample questionnaires/checklists that you can customize for use in guiding the work of your internal EMS audit team.

Example 16-1: Sample Questionnaire for EMS Audits

Principle 1: Management Commitment

1-1	Has your parent company issued a formal, written statement of environmental policy? When? How was your facility or operation made aware of this policy?
1-2	Has senior management issued a facility-specific, formal, written statement of environmental policy? When? How were facility personnel made aware of this policy? Do new personnel receive a copy of the policy? How?
1-3	What procedures are in place for regular review of and updates to the policy?
1-4	Has your facility established short- and long-term environmental goals? Please describe the key objectives and targets.
1-5	How and by whom are these goals developed? Did representatives of a variety of functions and levels within the facility work together to develop environmental objectives and targets?
1-6	What is the basis for your environmental goals? Are they based on compliance with legal requirements? Parent company directives? Environmental impacts of the facility's mission? Pollution prevention? Public perception? Employee initiatives?

Example 16-1: Sample Questionnaire for EMS Audits (Continued)

Principle 1: Management Commitment (Continued)

1-7	What are your most recent environmental initiatives?
1-8	What is the approval process for new environmental initiatives at your facility?
1-9	How are funds allocated for new environmental initiatives? For the environmental program? Who is ultimately responsible for these funding decisions?
1-10	Is staffing for the environmental program appropriate to program requirements and facility environmental goals? What mechanisms exist to adjust staffing level or staff capabilities?
1-11	Are managers familiar with facility and operation-specific environmental policies, regulations, and pollution prevention opportunities? Do managers participate in process reviews, assessments, environmental committees, or other activities to improve environmental performance?
1-12	How is this facility perceived by local environmental groups and the surrounding community? Are there any specific issues, i.e., noise, water quality, that are of particular concern?

Example 16-1: Sample Questionnaire for EMS Audits (Continued)

Principle 2: Compliance Assurance and Pollution Prevention

2-1	How and how often does the facility's environmental staff communicate with federal, state, and local regulatory agencies? Historically, how would you characterize the facility's relationship with these agencies?
2-2	Has the facility taken advantage of any EPA Technical Assistance programs? Other environmental technical assistance programs?
2-3	How does facility staff track and interpret new federal, state or local regulations, policies and programs, or changes to existing regulations, policies, and programs?
2-4	How are programs and procedures updated to reflect these changes?
2-5	How does facility staff maintain environmental documentation and records, e.g., manifests, TRI data? Who is responsible for reporting to federal or state agencies? Parent company?
2-6	Does the facility have an Emergency Response Plan? Spill Plan? What are the established procedures for an environmental emergency?

Example 16-1: Sample Questionnaire for EMS Audits (Continued)

Principle 2: Compliance Assurance and Pollution Prevention (Continued)

2-7	Has the facility performed a pollution prevention assessment?
2-8	Does the facility have a pollution prevention plan that addresses all environmental impacts and compliance programs?
2-9	Does the facility have a formal plan to reduce or eliminate the purchase and use of hazardous materials and ozone depleting chemicals? Does the facility have a hazardous materials pharmacy or similar program?
2-10	Does the facility have an affirmative procurement program?

Example 16-1: Sample Questionnaire for EMS Audits (Continued)

Principle 3: Enabling Systems

3-1	Does the facility have a formal, facility-wide environmental training program?
3-2	How are training requirements determined?
3-3	How are training records maintained?
3-4	What is the annual budget for environmental training?
3-5	Is funding available for staff development training opportunities?
3-6	What guidance is provided to staff concerning compliance with new or updated environmental regulations or policies?

Example 16-1: Sample Questionnaire for EMS Audits (Continued)

Principle 3: Enabling Systems (Continued)

3-7	How do managers communicate environmental performance issues or goals to staff?
3-8	What other mechanisms are used to increase staff environmental awareness? Newsletters? Seminars?
3-9	Is there a formal outreach effort to communicate the facility's environmental activities and programs to the community?
3-10	How does the facility evaluate the effectiveness of outreach efforts?

Example 16-1: Sample Questionnaire for EMS Audits (Continued)

Principle 4: Performance and Accountability

4-1	What are the routine reporting relationships between the environmental management program and upper level management?
4-2	How does the environmental staff communicate with upper management about environmental performance and the status of specific environmental initiatives?
4-3	How does the environmental program communicate with managers and staff about environmental performance and the status of environmental initiatives?
4-4	How do employees provide input to environmental decisions?
4-5	Are environmental duties included in staff job descriptions and performance standards?
4-6	How is excellence in environmental performance recognized and rewarded?
4-7	How do managers review and respond to poor environmental performance?

Example 16-1: Sample Questionnaire for EMS Audits (Continued)

Principle 5: Measurement and Improvement

5-1	What mechanisms are used to track and measure facility environmental performance? How often is such measurement performed?
5-2	Does the facility have a self audit or self monitoring program in place?
5-3	Does facility environmental staff conduct routine facility inspections? Tests of pollution control and monitoring equipment?
5-4	What are the current procedures for reporting an environmental problem? How does facility environmental staff track corrective action?
5-5	Does the parent company review facility environmental performance? How often are such reviews conducted?
5-6	Are written protocols or guidance documents used to conduct environmental performance reviews? Are summary reports available?

Example 16-1: Sample Questionnaire for EMS Audits (Continued)

Principle 5: Measurement and Improvement (Continued)

5-7	Does this facility participate in any cooperative environmental programs with state, local or private organizations?
5-8	Does this facility participate in any federal voluntary initiatives such as ENERGYSTAR or Performance Track?
5-9	What new environmental initiatives are planned for the facility?

Example 16-2: Sample Checklist for Top Management EMS Audits

Function: TOP MANAGEMENT

1. Environmental Policy	
Top Management	*Objective Evidence*
a. Describe your role in the development of the environmental policy.	
b. How do you know that your policy is appropriate for your activities, products, and services?	
c. What is management's role in the review and revision of the policy?	
d. How does management ensure continued adherence to the policy throughout the company?	
e. How does the policy help guide organizational decisions?	
f. How are employees made aware of the environmental policy?	
g. How is the policy made available to the public?	
[Auditor Note: Is there evidence that the policy was issued by top management? (e.g., Is the policy signed? By whom? At what level in the organization are they?)]	
Notes:	

2. Objectives and Targets	
Top Management	*Objective Evidence*
a. What are the environmental objectives and targets for your organization? What is your role in approving them? What are the relevant functions and levels within your organization that support the attainment of each of the objectives and targets?	
b. How are the environmental objectives linked to other organizational goals (and vice versa)?	
c. Are the objectives/targets consistent with the goals of the environmental policy for prevention of pollution and continual improvement?	
d. How were the objectives and targets developed by or communicated to management?	
e. How does management keep up with progress in meeting their objectives and targets throughout the year?	
f. How often are you informed of the status of the objectives and targets?	
g. On what basis are the objectives and targets reviewed and modified?	
Notes:	

Example 16-2: Sample Checklist for Top Management EMS Audits (Cont.)

3. Structure and Responsibility	
Top Management	*Objective Evidence*
a. At what level within the organization is the designated EMR placed? *<u>Auditor Note</u>: Is the EMR at a level within the organization to effectively implement an EMS for his/her organization?]*	
b. What authority does the EMR have to carry out his/her responsibilities?	
c. How does the organization assess its resource needs for environmental management? How are these factored into operating and strategic plans (and vice-versa)?	
d. What resources (financial, technical personnel) has management provided to develop or maintain the EMS?	
e. How are you informed on the performance of the EMS? Do you receive routine reports?	
f. Are responsibilities for the environmental management of the organization documented? If so, where? Is an integrated structure in place in which accountability and responsibility are defined, understood, and carried out?	
g. How are these responsibilities communicated to all employees (including managers)?	
Notes:	

4. Communication	
Top Management	*Objective Evidence*
a. How are you informed of the environmental issues within your organization? How often does this take place? Does this include compliance issues?	
b. How are you kept up to date with progress in meeting your organization's environmental objectives and targets? How is this information passed on to your managers?	
c. How do you communicate with the organization on environmental issues? How is this done? How frequently?	
d. How does the organization handle inquiries from interested parties (e.g., the public, regulators, other organizations) on environmental matters? Who has responsibility for responding to such inquiries?	

Example 16-2: Sample Checklist for Top Management EMS Audits (Cont.)

5. Management Review	
Top Management	*Objective Evidence*
a. Describe the organization's management review process.	
b. How often are management reviews performed? How was this frequency determined?	
c. Who is involved in the management review process? What are their roles in this process?	
d. What changes have been made to the EMS as a result of the last review?	
Notes:	

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MODULE 17: MANAGEMENT REVIEW

Guidance and Tools

Management reviews are one **key to continual improvement** and for ensuring that the EMS will continue to meet your organization's needs over time.

The goal of the review allows management to bring about overall improvements. The scope and frequency of the review should depend upon the size and complexity of the organization and the complexity and amount of activity of your EMS.

To maintain **continual improvement, suitability, and effectiveness** of your environmental management system, and thereby its performance, your organization's senior management should review and evaluate the environmental management system at defined intervals, such as quarterly. The scope of the review should be comprehensive, though not all elements of an environmental management system need to be reviewed at once, and the review process may take place over a period of time. Review of the policy, objectives, and procedures should be carried out by the level of management that define them. Following is a checklist of some of the things that should be included in the management review:

- Results from assessment;
- The extent to which objectives and targets have been met;
- The continuing suitability of the environmental management system in relation to changing conditions and information; and
- Concerns among relevant interested parties.

Questions for management to consider include:

- Is our environmental policy still relevant to what we do?
- Performance toward objectives, targets and EMPs (charts, tales and graphs are encouraged to show results)
- Can we set new measurable performance objectives?
- What are the results of our internal audits?
- What is the status of corrective and preventive actions?
- Are roles and responsibilities clear and do they make sense?
- Are we applying resources appropriately?
- Are we meeting our regulatory obligations?

- Do changes in laws or regulations require us to change some of our approaches?
- Are the procedures clear and adequate? Do we need others? Should we eliminate some?
- What effects have changes in materials, products, or services had on our EMS and its effectiveness?
- What stakeholder concerns have been raised since our last review?

Create a continual improvement plan and check progress. Document observations, conclusions, and recommendations for necessary action. Assign action items for follow-up, and schedule the next regular review.

Management reviews also offer a great opportunity to keep your EMS **efficient and cost-effective**. For example, some organizations have found that certain procedures and processes initially put in place were not needed to achieve their environmental objectives or to control key processes. **If EMS procedures and other activities don't add value, eliminate them.**

The key question that a management review seeks to answer:

"Is the system **working**?" (i.e., is it suitable, adequate, and effective, given our needs?)

Hints

- Two kinds of people should be involved in the management review process:
    - People who have the right **information** / knowledge; and
    - People who can **make decisions** about the organization and its resources (top management).
- Determine management review **frequency** that will work best for your organization. Some organizations combine these reviews with other meetings (such as director meetings). Other organizations hold "stand-alone" reviews. At a minimum, consider conducting management reviews at least once per year.
- During management review meetings, make sure that someone records what **issues** were discussed, what **decisions** were arrived at, and what **action** items were selected. Results of management reviews should be **documented**.
- Management reviews should assess how **changing circumstances** might influence the suitability, effectiveness, or adequacy of your EMS. Changing circumstances might be **internal** to your organization (such as new facilities, new raw materials, changes in products or services, new customers, etc.) or might be **external** factors (such as new laws, new scientific information or changes in adjacent land use).
- After documenting the action items arising from your management review, be sure that someone **follows up**. Progress on action items should be tracked to completion.

- As you assess potential changes to your EMS, consider **other organizational plans and goals**. In this way, environmental decision-making can be integrated into your overall management and strategy.

Tool 17-1 is a questionnaire to guide your facility in establishing and maintaining an EMS management review element. If you desire to make a documented procedure for management review of your facility's EMS, then **Tool 17-2** is a sample procedure you could adapt. **Tool 17-3** can be used to record implementation of your procedure.

Tool 17-1: Management Review Worksheet

Questions	Your Answers
Do we have an **existing process** for conducting management reviews? If yes, does that process need to be revised? In what way?	
Who needs to be involved in this process within our organization?	
When is the **best time** for us to implement this process? Can this effort be **linked** to an existing organizational process (such as our budget, annual planning, or auditing cycles?)	
How **frequently** are management reviews? What is the **basis** for this frequency? Should we conduct reviews more or less frequently?	
Who is responsible for **gathering the information** needed to conduct management reviews? Who is responsible for **presenting** this information?	
How do we ensure that **changing circumstances** (both internal and external to the organization) are considered in this process?	
How do we ensure that the **recommendations** of management reviews are **tracked and acted upon**?	
Our next step on management review is to …	

Tool 17-2: Sample Procedure for Management Review

1.0 Purpose

To ensure the effectiveness of the EMS and its continual improvement, **[Your Facility's Name]** top management periodically reviews the important elements and outcomes of the EMS.

2.0 General

The management review process is intended to provide a forum for discussion and improvement of the EMS and to provide management with a vehicle for making any changes to the EMS necessary to achieve the organization's goals.

3.0 Procedure

3.1 In preparation for the management review, the environmental management representative (EMR) gathers the following information and makes it available to top plant management, including the owner and President of **[your corporation]** and the plant manager:

- Environmental policy
- List of the Cross Functional Team (CFT) members and others responsible for major parts of the EMS
- List of significant environmental aspects and criteria of significance
- Update on compliance status of the plant and on any potential upcoming regulations that might require an advance strategy
- List of environmental objectives and targets
- Environmental performance results (from monitoring and measuring significant environmental aspect indicators and indicators of progress toward environmental objectives and targets)
- Bullet-point descriptions of other accomplishments of the EMS (e.g., number of people trained)
- Results of most recent EMS internal assessment, compliance assessment and corrective actions taken
- Description and documentation of feedback from stakeholders (if received)
- Analysis of the costs and benefits of the EMS (as quantitative as possible)

3.2 Top plant management meets to review and discuss the information presented. The EMR and EMS Coordinator will also be present. Depending on its review, top management may direct specific and/or significant changes in the scale and direction of the EMS in order to improve its effectiveness and business value. The conclusions and directives that result from the management review are recorded and kept by the EMS Coordinator.

4.0 Frequency

Quarterly.

5.0 Records

Results of management reviews are recorded using **Sample Management Review Record (Tool 17-3)**. Records are kept by the EMS Coordinator.

Tool 17-3: Sample Management Review Record

Date of review meeting	
Persons present at meeting	
Name	Position
Conclusions	
Actions to be taken	Person(s) responsible

Signed: _____ _____

Environmental Management Representative

Plant Manager

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