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Environmental Management System Resource Manual

Volume I

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Getting Started

"Section 3: Ready! Initial EMS Planning" from NSF Guide

"Section 5: GO! Roadmap for EMS Development" from NSF Guide

"Road Maps" from EPA IEMS Guide

"Implementation Elements" from College and University EMS Guide

Sample Timeline from "ISO 14001 EMS Implementation Planning"

"USPS Strategic Plan"

"Background of EMS" Ellipson Mgmt Consultants

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Section 3: READY! (Initial EMS Planning)

Putting the theory of EMS into practice

Building an EMS might sound like an overwhelming task for a smaller organization, but it need not be. Since time and other resources are limited in any organization, it is important that you use resources wisely. One way to do this is by preparing and following a simple, effective **plan**. Fortunately, you can build on the experiences of other organizations that have already implemented an EMS. Examples are provided throughout this Guide.



Milan Screw Products found that the use of a cross-functional team (the environmental task group) was the key to progress in evaluating and implementing their EMS. Participation of line managers and employees is essential in successfully implementing an EMS.

Figure 2 illustrates the initial steps in the EMS planning process. The importance of careful planning cannot be overemphasized. Taking the time to figure out **what** you need to do, **how** you will do it, and **who** must be involved will pay big dividends down the road.

Experience shows that using a **team approach** to planning and building an EMS is an excellent way to promote commitment and ensure that your objectives, procedures and other system elements are realistic, achievable, and cost-effective. Ideas for using a team and involving employees are discussed in this section.



Appendix F has information on EMS resources

A few **hints** to keep in mind as you build your EMS:

- Help is available — don't hesitate to use it. (See **Appendix F** for information on resources.)
- Pace yourself. Move quickly enough that employees stay interested and engaged, but not so fast that those involved are overloaded or that the effort becomes superficial.



K.J.Quinn & Company found that it could perform an initial assessment of its environmental programs in 20-25 hours

- Don't re-invent the wheel -- existing management practices should help you to meet EMS requirements.
- Consultants can help you evaluate your EMS and suggest approaches used successfully elsewhere. Explore ways to hold consulting costs down. You may be able to join forces with other organizations to hire a consultant or sponsor a training course.



Preliminary Review Tools: See the "NSF ISO 14001 Self Assessment Tool" (at www.nsf-isr.org) or "Incorporating Design for Environment into your Gap Analysis" (at www.epa.gov/dfe)

Some Thoughts on Using Consultants

- Assess your own in-house resources first.
- Ensure both parties understand the scope of work.
- Get references and check them. Look for consultants with experience in small organizations and your specific industry.
- Use consultants to gain insights on approaches used by other organizations.
- An EMS developed by consultants "in isolation" will not work. Your own people need to be involved in the EMS development process.

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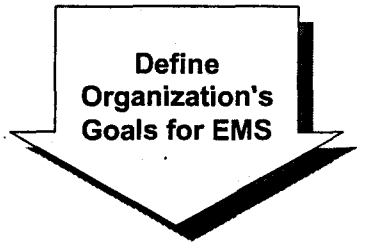
FIGURE 2: INITIAL EMS PLANNING STEPS



READY!

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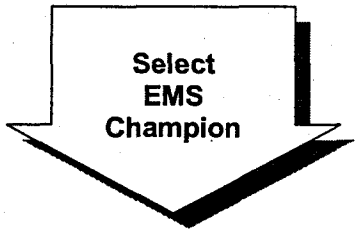
Laying the Groundwork for an EMS: Key Steps



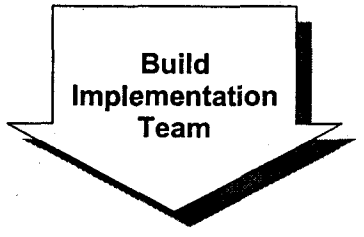
A first step in EMS planning is to **decide why you are pursuing the development of an EMS.** Are you trying to improve your environmental performance (for example, compliance with regulations or prevent pollution)? Are you trying to promote involvement throughout the organization? Write your goals down and refer back to them frequently as you move forward. As you design and implement the EMS, ask: How is this task going to help us achieve our goals? This also is a good time to define the **project scope** or **"fenceline"** (i.e., what is the "organization" that the EMS will cover? One location? Multiple locations? Should we "pilot" the EMS at one location then implement the system at other locations later?).



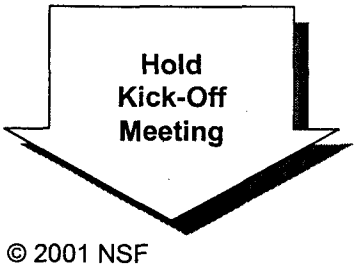
One of the most critical steps in the planning process is **gaining top management's commitment** to support EMS development and implementation. Management must first understand the benefits of an EMS and what it will take to put an EMS in place. Explain the strengths and limitations of your current approach and how those limitations can affect the organization's financial and other performance. Management also has a role in ensuring that the **goals** for the EMS (see above) are clear and consistent with other organizational goals. Management's commitment should be communicated across the organization.



Not all small- or medium-sized organizations have the luxury of choosing among multiple candidates, but your choice of **project champion** is critical. The champion should have the necessary authority, an understanding of the organization, and project management skills. The champion should be a "systems thinker" (ISO 9000 experience can be a plus, but is not necessary), should have the time to commit to the EMS-building process and must have top management support.



A **team** with representatives from key management functions (such as engineering, finance, human resources, production and/or service) can identify and assess issues, opportunities, and existing processes. Consider including contractors, suppliers or other external parties as part of the project team, where appropriate. The team will need to meet regularly, especially in the early stages of the project. A cross-functional team can help to ensure that procedures are practical and effective and can build commitment to and "ownership" of the EMS.

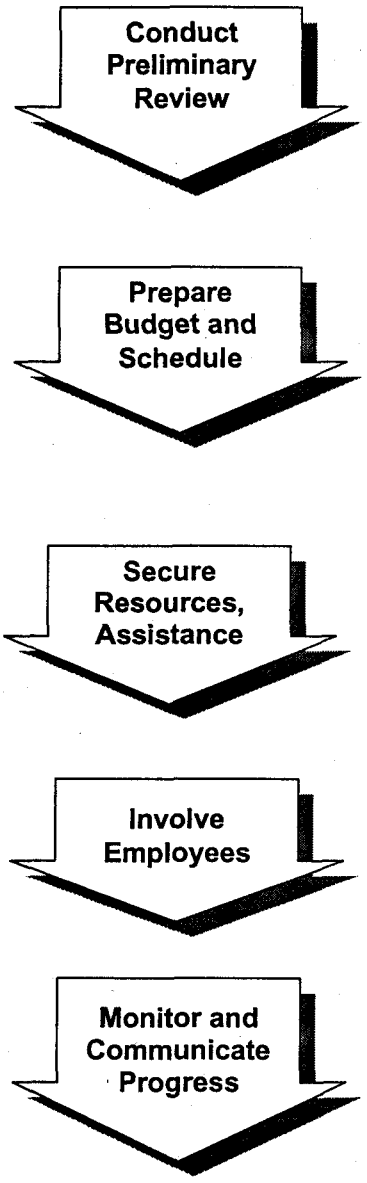


Once the team has been selected, **hold a kick-off meeting** to discuss the organization's objectives in implementing an EMS, the steps that need to be taken initially, and the roles of team members, among other topics. If possible, get top management to describe its
mitment to the EMS at this meeting. The kick-off

more...

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Creating Your Own EMS (cont'd.)



meeting also is a good opportunity to provide some EMS training for team members. Follow-up this meeting with a communication to all employees.

The next step is for the team to conduct a **preliminary review** of your current compliance and other environmental programs/systems and to compare these against the criteria for your EMS (such as ISO 14001). Evaluate your organization's structure, procedures, policies, environmental impacts, training programs and other factors. Determine which parts of your current EMS are in good shape and which need additional work. See the "NSF ISO 14001 Self-Assessment Tool" (www.nsf-isr.org) or "Incorporating Design for the Environment into Your Gap Analysis" (www.epa.gov/dfe) for gap analysis tools.

Based on the results of the preliminary review, prepare a **project plan and budget**. The plan should describe in detail what key actions are needed, who will be responsible, what resources are needed, and when the work will be completed. Keep the plan flexible, but set some stretch goals. Think about how you will maintain project focus and momentum over time. Look for potential "early successes" that can help to build momentum and reinforce the benefits of the EMS.

The plan and budget should be reviewed and **approved by top management**. In some cases, there may be **outside funding or other types of assistance** that you can use (from a trade association, a state technical assistance office, etc.). See Appendix F for more ideas on possible sources of help.

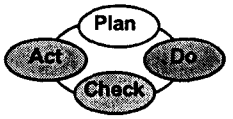
Employees are a great source of knowledge on environmental and health & safety issues related to their work areas as well as on the effectiveness of current processes and procedures. They can help the project team in drafting procedures. **Ownership** of the EMS will be greatly enhanced by meaningful employee involvement in the EMS development process.

As you build the EMS, be sure to regularly **monitor your progress** against the project plan and **communicate** this progress within the organization. Be sure to communicate the **accomplishments** that have been made and describe what happens next. Build on small successes. Be sure to keep top management informed and engaged, especially if additional resources might be required.



Advertise your successes to keep management and employees aware of your EMS efforts. Document benefits, no matter how small they may seem at the time. As this list grows, so will EMS support.

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Section 4: SET! (Key Elements of an EMS)

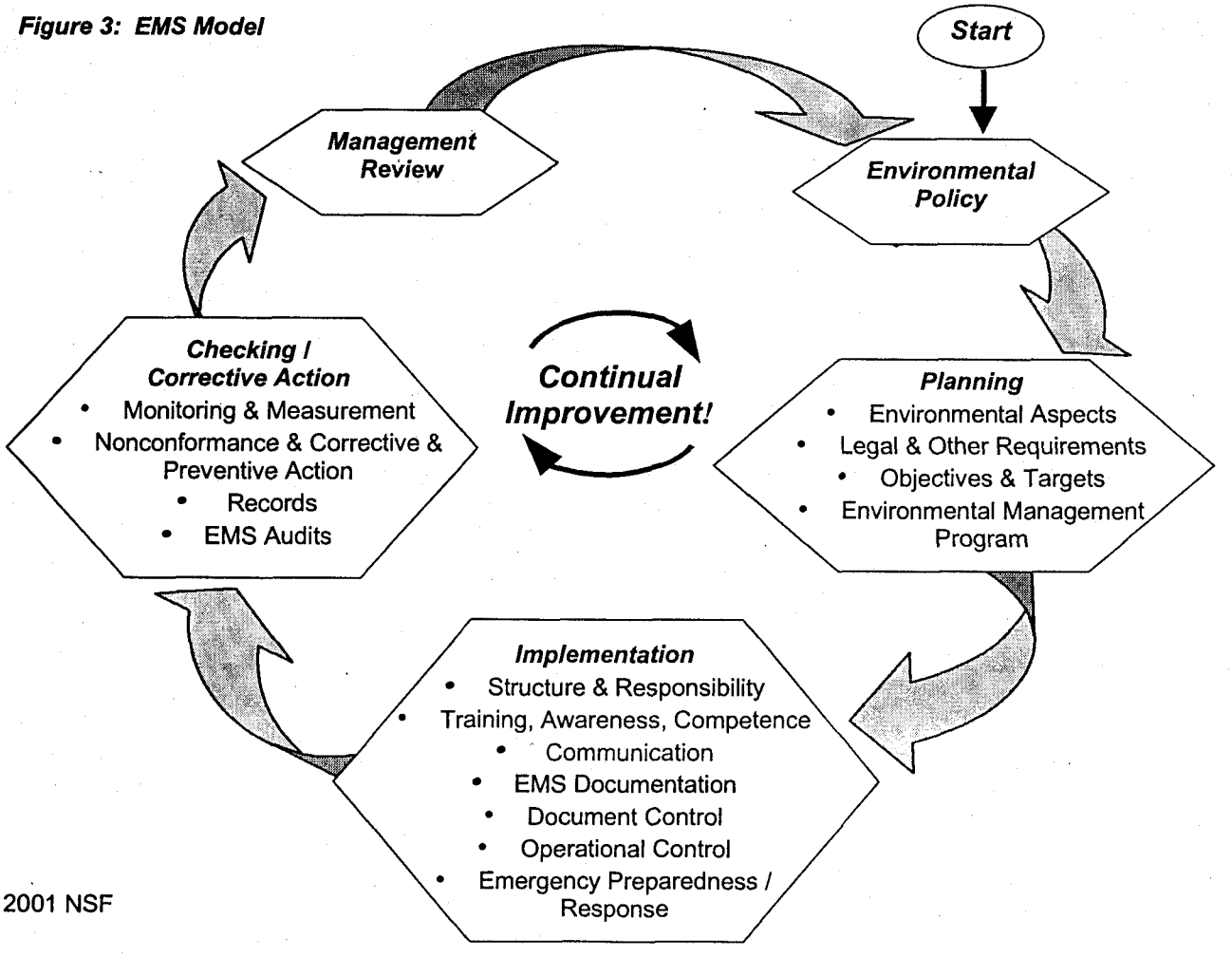
What does an EMS consist of? How are the elements linked together?

As mentioned earlier, your EMS should be built on the "Plan, Do, Check, Act" model to ensure that environmental matters are systematically **identified, controlled, and monitored**. Using this approach will help to ensure that performance of your EMS **improves** over time and that you meet your goals for implementing an EMS in the first place.

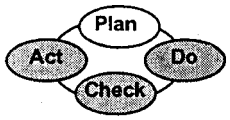
This section describes seventeen EMS elements that are common to most EMS models. This section also notes the **key linkages** among these elements. While there are several good EMS models available, this Guide generally uses the ISO 14001 Standard as a starting point for describing EMS elements. This has been done for several reasons:

- ISO 14001 is a widely accepted international standard for EMS that focuses on continual improvement;
- Companies may be asked to demonstrate conformance with ISO 14001 as a condition of doing business in some markets; and
- The Standard is consistent with the key elements found in many EMS models, including the European Union's Eco-Management and Audit Scheme, EPA's Performance Track and the Code of Environmental Management Principles for Federal Agencies, among others.

Figure 3: EMS Model



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Key Elements of an EMS: A Snapshot

- **Environmental policy** — Develop a statement of your organization's commitment to the environment. Use this policy as a framework for planning and action.
- **Environmental aspects** — Identify environmental attributes of your products, activities and services. Determine those that could have significant impacts on the environment.
- **Legal and other requirements** — Identify and ensure access to relevant laws and regulations, as well as other requirements to which your organization adheres.
- **Objectives and targets** — Establish environmental goals for your organization, in line with your policy, environmental impacts, the views of interested parties and other factors.
- **Environmental management program** — Plan actions necessary to achieve your objectives and targets.
- **Structure and responsibility** — Establish roles and responsibilities for environmental management and provide appropriate resources.
- **Training, awareness and competence** — Ensure that your employees are trained and capable of carrying out their environmental responsibilities.
- **Communication** — Establish processes for internal and external communications on environmental management issues.
- **EMS documentation** — Maintain information on your EMS and related documents.
- **Document control** — Ensure effective management of procedures and other system documents.
- **Operational control** — Identify, plan and manage your operations and activities in line with your policy, objectives and targets.
- **Emergency preparedness and response** — Identify potential emergencies and develop procedures for preventing and responding to them.
- **Monitoring and measurement** — Monitor key activities and track performance. Conduct periodic assessments of compliance with legal requirements.
- **Nonconformance and corrective and preventive action** — Identify and correct problems and prevent their recurrence.
- **Records** — Maintain and manage records of EMS performance.
- **EMS audit** — Periodically verify that your EMS is operating as intended.
- **Management review** — Periodically review your EMS with an eye to continual improvement.

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Section 5 : GO! (Roadmap for EMS Development)

A sequence of activities for building an EMS from the ground up

Once you gain an understanding the individual elements of an EMS, you can begin the process of **putting these elements in place**. Each of the individual EMS elements is described in detail in Section 4. Also, several "up front" EMS planning tasks (such as gaining top management commitment) were described in Section 3.



Ford Motor Company conducted ISO 14001 implementation workshops for its suppliers. Part of these workshops was devoted to a discussion of how to "launch" the EMS effort through a set of implementation steps.

Experience of many organizations shows that the **order** in which EMS implementation activities should take place is not always obvious or intuitive. Further, the optimal **sequence of implementation activities** does not necessarily follow the order in which elements are described in various EMS models, such as ISO 14001. Using a logical sequence can save time and money and minimize the "false starts" an organization might make.

This section provides a **step by step action plan** for developing and implementing the elements of an EMS. It describes a logical sequence or "roadmap" for planning and implementing EMS elements and explains how this sequence can be important in building an effective EMS.



The Washtenaw County Home Toxics Reduction Program (HTRP) successfully linked its management review process with its new Business Improvement Process (BIP). HTRP used its environmental objectives as input to the BIP and reviewed progress annually to determine what worked and to make adjustments, where needed. The output of BIP will feed into the County's budgeting process.

Keep in mind that this is just one way to do the job– you might find other approaches that work just as well.

Figure 14 illustrates the suggested implementation process flow. Each of the steps (and a rationale for their sequence) is discussed below.

A few **hints** to keep in mind as you build your EMS:

- **You may already have some EMS elements in place**, as indicated by the preliminary review that you performed earlier (see Section 3 for more details).
- Make sure to build in the **links between elements**. Refer back to Section 4 for information on the key links. The effectiveness of your EMS depends as much on the strength of its links as it does on the strength of the individual elements themselves.
- For many EMS elements, you will need to **design and implement a process**. In these cases, you also should consider **documenting** the process in the form of a **procedure**.

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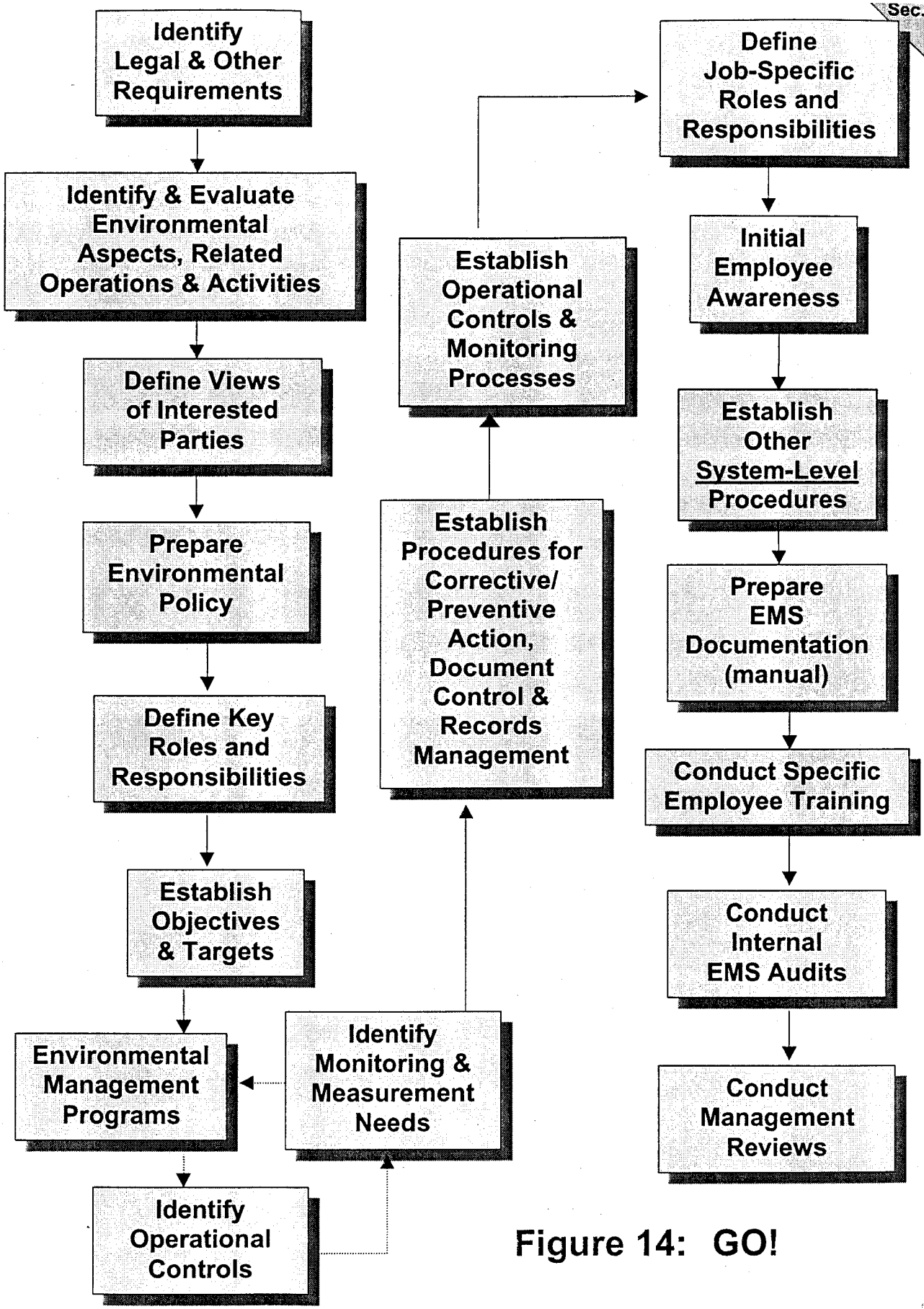


Figure 14: GO!

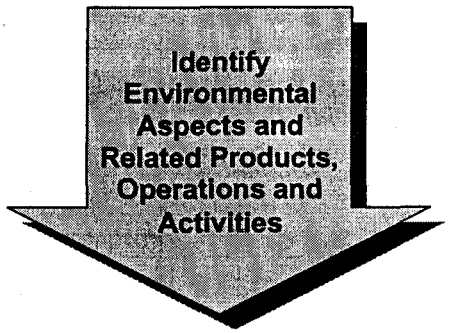
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Creating Your EMS: Step by Step



A first step in the EMS-building process is **understanding the legal and other requirements** that apply to what you do (i.e., that apply to your products, activities and services). This step is important for understanding compliance obligations and how these obligations affect the overall EMS design. For example, you might have an operation that is covered by an air quality permit or might provide a service that results in the generation of regulated wastes. Your EMS should include processes to ensure that such legal requirements are addressed when you conduct these operations (or when they are modified).

Your EMS should be designed to help you accomplish more that just compliance with applicable laws and regulations, but these compliance requirements should be a major consideration. Performing this step first allows you to understand how legal requirements might relate to the environmental aspects and impacts of your products, activities and services, as discussed next.



Once you understand what "rules" apply, you should **assess how your organization interacts with the environment.** This is accomplished by identifying your environmental **aspects and impacts** and determining which of them are significant. Some of your environmental aspects may be regulated, while others may not be.

As you identify and assess your aspects, you also should **identify specific products, operations and activities** from which these aspects / impacts arise. Likewise, you can identify any **monitoring** that is performed of these operations or activities for environmental purposes. For example, if you identify the generation of a particular air emission as a significant environmental aspect, it would help to know which operation(s) generate such air emissions. It might also help to know whether these air emissions are monitored or otherwise measured in some manner.

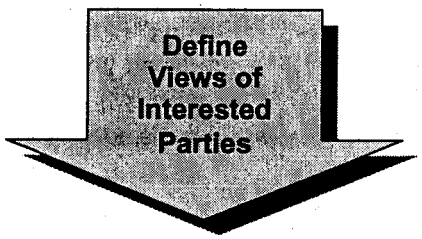
Collecting this information at an early stage will help you implement subsequent EMS elements. You can use a form (such as **Figure 15**) to capture this information. One caveat -- just because you identify an existing control and/or monitoring activity related to a particular operation or activity, **don't automatically assume that these controls are adequate** for EMS purposes. The adequacy of these controls will depend on several factors, including your objectives and targets.

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Figure 15: **Linking Operations, Aspects, Controls and Monitoring (example)**

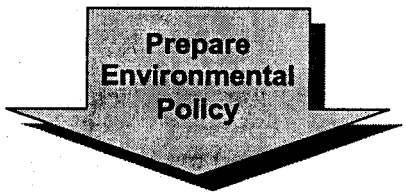
Source	Significant Aspect(s)	Regulated?	Associated Controls	Associated Monitoring or Measurement
Operations *Parts painting*	• *Air emissions (VOCs)* • *Solvent waste generation*	• *Yes* • *Yes*	• *Limits on VOC content in paints and operating hours* • *SOP for HW generation*	• *Paint use records, log of operating hours* • *Waste tracking sheet*
Parts plating	• *Waste generation* • *Water discharges*	• *Yes* • *Yes*	• *SOP for HW generation* • *Notification to site effluent treatment plant*	• *Waste tracking sheet* • *Pre-discharge sampling*
Other Activities *Raw material storage*	• *Potential spills*	• *Yes*	• *Stormwater Pollution Prevention Plan*	• *Weekly inspections of storage area*
Fleet maintenance	• Waste oil generation • *Potential spills*	• *Yes* • *Yes*	• *SOP for HW generation* • *Stormwater Pollution Prevention Plan*	• *Waste tracking sheet* • *Weekly inspections of storage area*
Products *Pumps*	• *Energy Use* • *Chromium content*	• *No* • *No*	• *None* • *None*	• *None* • *None*
Services *Equipment servicing at customer sites*	• *Waste generation* • *Fuel use*	• *No* • *No*	• *SOP for equipment service* • *None*	• *Waste tracking sheet* • *Fuel dispensing records*

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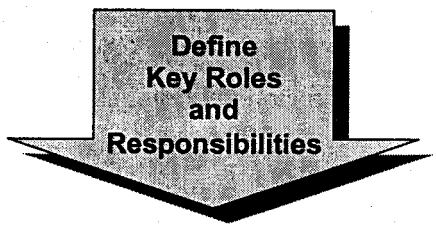
Armed with information on applicable legal and other requirements as well as the environmental attributes of your products, activities and services, you should **gather information of the views of your "stakeholders"** (or interested parties). Stakeholders might include, for example, your neighbors, interest groups, regulators and others. Their views might address how your organization affects the environment, how well you are meeting your environmental obligations, and whether your organization is a "good neighbor", among other topics. There are many ways to collect information on stakeholder views, as discussed in Section 4 (See "Communication").

Gathering this information now allows you to consider stakeholder input in the development of your environmental policy. Since you have already assessed your legal and other requirements and your environmental aspects, you should be in a good position to have meaningful dialogues with these stakeholders.



At this point, you should have a sound basis for **developing** (or possibly amending) **your environmental policy**. Using the information developed in the previous three steps allows your organization to prepare a policy that is relevant to the organization and the key issues that it faces. For example, you will have information on the views of your stakeholders that might be valuable in developing an environmental policy.

Keep in mind that you evaluated your current environmental programs when you performed the preliminary review (see Section 3), so you should understand how (and how well) you are currently managing these key issues.



Once the environmental policy has been written, you can begin to **define key roles and responsibilities** within the EMS. At this stage of implementation, focus on "higher-level" responsibilities, such as the roles and responsibilities of senior management, key functional leaders and environmental staff (if one exists). EMS responsibilities for other specific jobs or functions will be identified in a later step. Once the key roles and responsibilities have been defined, obtain the input of these individuals in the next step of the process – establishing objectives and targets.

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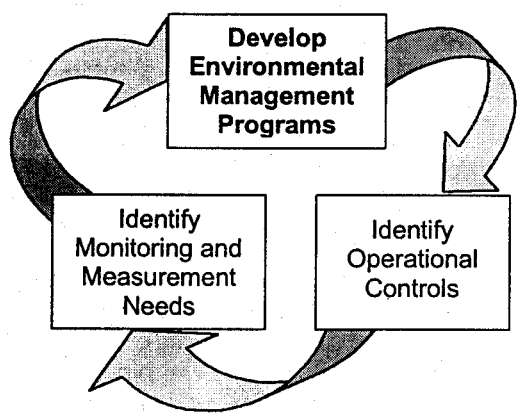


At this point you are ready to **establish environmental objectives and targets** for your organization. These objectives should be consistent with your environmental policy. Each of your objectives also should reflect the analyses you carried out on legal and other requirements, environmental aspects and impacts, and the views of interested parties (as well as the other factors discussed in Section 4).

You identified the operations and activities related to your significant aspects and impacts in an earlier step. Also, you defined certain key roles and responsibilities. This information will help you to determine the **relevant levels and functions** within the organization for achieving objectives and targets. For example, if you set an objective to reduce hazardous waste generation by 10% this year, you also should know which parts of the organization must be involved in order to meet this objective.

This brings us to one of the most challenging (and potentially most valuable) steps in the overall process. Armed with an understanding of legal requirements, your significant environmental aspects and impacts, and your objectives and targets, your are ready to **tackle several EMS elements simultaneously**. These elements include the design of environmental **management programs**, the initial identification of necessary **operational controls**, and the initial identification of **monitoring and measurement** needs. One reason combining these steps is that they can often overlap significantly. For example, your environmental management program for achieving a certain objective (such as maintaining compliance with regulations) might consist of a number of existing operational controls (procedures) and monitoring activities. Similarly, achieving an objective might require a feasibility study or the implementation of certain "new" operational controls. Likewise, determining progress on achieving objectives often requires some form of monitoring or measurement.

Figure 16



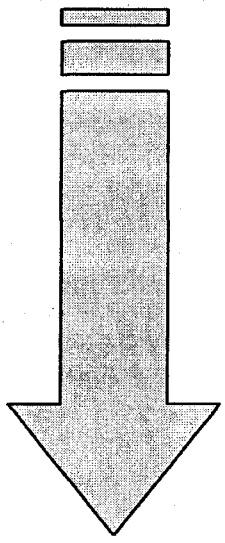
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One important caveat: Keep in mind that operational controls and monitoring / measurement processes might be needed **even if** no objective (or corresponding management program) exists for a particular operation or activity. For example, controls might be needed for certain operations to ensure compliance with legal requirements or to control a significant environmental aspect, even where no specific objective has been set. The initial identification of operational control needs at this point in the process should be supplemented by a more detailed design of operational controls and monitoring processes, as described in a subsequent process step.



An example of a form for describing environmental management programs that shows the links between programs and operational controls is provided in the Tool Kit (Appendix A)

Also keep in mind that this **process is usually iterative.** That is, you might need to "re-visit" your management programs, operational controls and monitoring processes over time to ensure they are consistent and up-to-date.

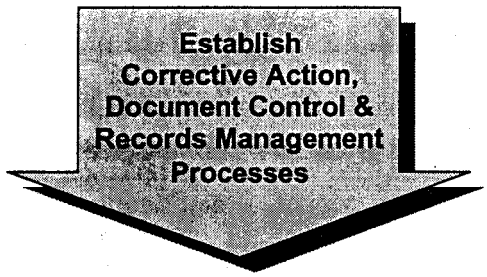


You should already have a **head start** on this step, since you identified operations and activities related to your significant environmental aspects (as well as existing control and monitoring processes) several steps ago. *Remember how we said this was a good idea?*

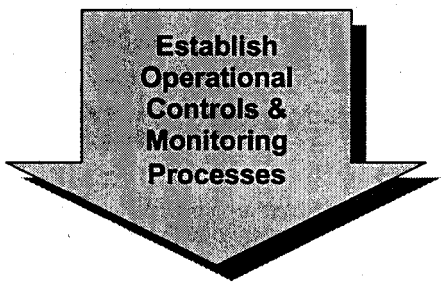
Your don't need to fully develop these operational controls and monitoring activities yet – that step comes later (see "Design Operational Controls & Monitoring Processes"). What you need to do now is **compile a list of your operational control and monitoring <u>needs</u>**. As you develop your environmental management programs, ask yourself the following questions:

- How do we control this operation or activity <u>now</u>?
- Are these controls <u>adequate</u> to meet our objectives and to ensure compliance?
- If <u>additional controls</u> are needed, <u>what types</u> of controls make sense?
- What type of <u>monitoring / measurement</u> is needed to <u>track our progress</u> in achieving objectives and to <u>ensure that operational controls are implemented</u> as designed?

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At this stage of implementation, your EMS will begin to generate some documents (such as procedures and forms) and records (that demonstrate that various processes are being carried out). For this reason, it is a good time to **establish procedures for corrective/preventive action, document control, and records management**. These three processes are essentially "system maintenance" functions. As you develop and implement other system-level procedures, work instructions for various activities, and other EMS documents, you need a process for controlling the generation and modification of these documents. Likewise, you will need a process to ensure that you can fix (or correct) problems when they occur. In addition, many of these processes (such as monitoring activities) will generate records, so you need an effective way to manage the records that your EMS generates.



Once the system maintenance functions are in place, you can start in earnest the **establishment of activity- or area-specific operational controls and monitoring processes**. As a starting point, refer back to the list of operational control and monitoring needs that you generated in preparing your environmental management programs (see earlier step). Also, you should have a template for the development of these work instructions (or standard operating procedures), since your document control process was established in the prior step. Remember that you might need operational controls and monitoring processes to meet your **policy commitments** and **control significant environmental aspects**, even where no specific objectives or environmental management programs have been established.

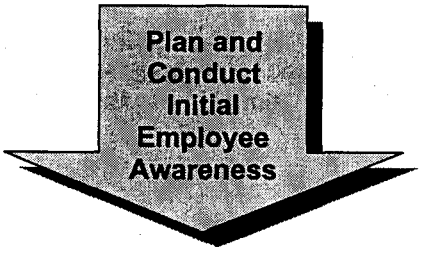
Employees that work in relevant operations or activities can provide a lot of support here. Also, note that these operational controls and monitoring processes can play an important role in employee training, as discussed later.

Also keep in mind that you also need a procedure for conducting **periodic compliance evaluations**.

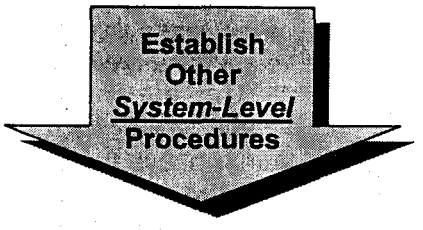
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As part of the process described above, you should **define job-specific roles and responsibilities**. Such roles and responsibilities should address the specific operational controls and monitoring processes discussed above. You might want to document these responsibilities in a **responsibility matrix** or in some other form that is easily communicated to employees.

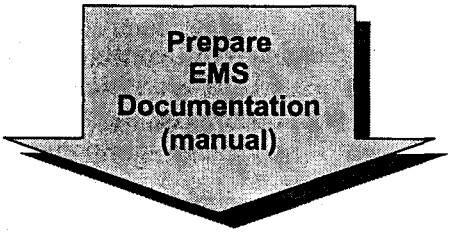


Initial employee awareness training should be conducted to promote understanding of the organization's EMS efforts and the progress made to-date. As a first step, train employees on the environmental policy and other elements of the EMS. Discuss the environmental impacts of their activities, any new / modified procedures, the organization's objectives and targets, as well as their EMS responsibilities. If you have contractors or others at your site who are not employees of your organization, consider whether these other individuals should be included in these EMS awareness sessions.



Some system-level procedures (such as the procedures for identification of environmental aspects and access to legal and other requirements) were developed at earlier stages of the process. At this point, you **can establish any other procedures required for the EMS**. These other system-level procedures might include, for example:

- employee training and awareness,
- internal and external communication,
- emergency preparedness and response,
- EMS auditing, and
- management review.



Once you have established roles and responsibilities and defined all of your system-level procedures, **preparing the EMS manual** should be a relatively simple matter. The manual should summarize the results of your efforts so far (that is, it should describe the processes you have developed, the roles and responsibilities you have defined as well as other EMS elements). Also, it is important to describe the **links** among system elements and provide direction to other system documents. Keep the manual simple – there is no need to provide great detail on any particular system process. Readers can be referred to the detailed procedures if more information is needed.

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Once the procedures and other system documentation have been prepared, you are ready to **conduct specific employee EMS training**. As a first step, identify specific **training needs**. Employee training should be designed to ensure understanding of:

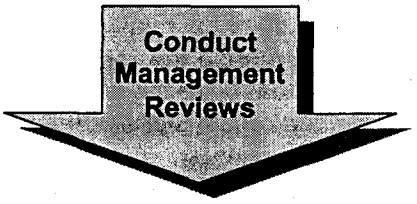
- key system processes,
- operational controls related to their specific jobs, and
- any monitoring or measurement for which they are responsible.

Job-specific training should also cover topics such as EMS auditing for those employees that will conduct internal EMS audits.



Once internal auditors have been selected and trained, you should **design and initiate the internal auditing process**. At this point, you should have sufficient EMS processes in place to conduct meaningful audits. Many organizations find that it is easier to start with smaller, more frequent audits that to audit the entire EMS at once. These early audits can serve as a learning tool for the auditors.

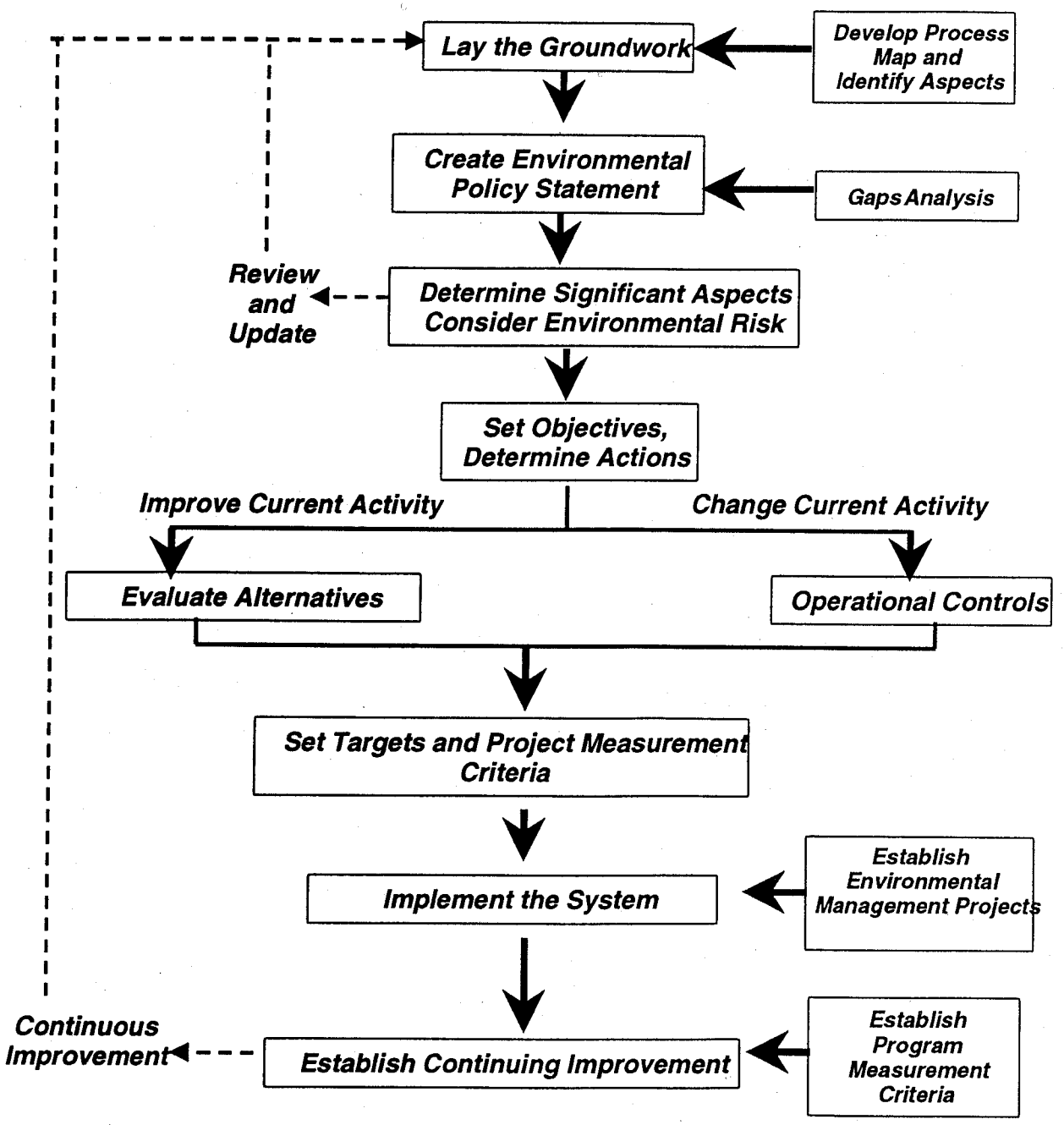
Once the audit results are known, use **the corrective and preventive action process** you developed earlier to address any identified problems. Audit records should be managed in accordance with the records management process.



Use the results of your internal audits (along with other information on the EMS) to **conduct management reviews**. Management should consider the need for any changes to the EMS and make assignments for any changes needed. Such assignments should be consistent with the roles and responsibilities established previously.

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Figure C: IEMS Process



EPA's Integrated EMS Implementation Guide
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worksheet from the DfE Printing Project, resources for more information, and blank forms that correspond to the worksheets in each module. In addition to the Appendices, more tools and guidance can be found on the DfE's website at www.epa.gov/dfe. In particular, there is a more extensive Risk Guide and Cleaner Technology Substitutes Assessment Guide.

Module 1: Laying the Groundwork

This module provides a general discussion of what an IEMS contains. It will help you build understanding of and support for your IEMS among your company's managers and employees, about what an IEMS is and why the company is developing one. This module also will help you understand how your company currently impacts the environment by identifying environmental impacts of your company's products, processes and services.

Module 2: Creating an Environmental Policy

An early step in the process of developing a IEMS is reviewing your company's current methods for managing environmental concerns. Next you will write your company's environmental policy statement and decide on the scope of your IEMS. The environmental policy will be based on what is important to your company. This module contains some sample principles and policy statements.

Module 3: Determining Significant Environmental Aspects and Setting Objectives

You will need to determine which environmental aspects are significant, and prioritize them to determine what you want to address first. This module provides a method to estimate environmental risk to help you prioritize environmental aspects. The module then helps you to translate those priorities into objectives to reduce environmental impact.

☞ **Tip**

Environmental aspects are elements of your business, such as air pollutants or hazardous **waste**, that can have negative impacts on people and/or the environment.

Figure D. Road Map between ISO 14001 and IEMS Approach

ISO14001 EMS COMPONENTS	IEMS GUIDE MODULES
Commitment and Policy	Module 1: Laying the Groundwork Module 2: Creating an Environmental Policy
Planning	Module 1: Laying the Groundwork Module 3: Determining Significant Environmental Aspects and Setting Objectives
Implementation	Module 4: Evaluating Alternatives Module 5: Setting Targets and Measuring Success Module 6: Developing Operational Controls Module 7: Implementing Your IEMS Module 8: Building Organizational Support
Evaluation	Module 5: Setting Targets and Measuring Success Module 8: Building Organizational Support
Review	Module 9: Establishing Continuing Improvement

Module 4: Evaluating Alternatives

Before deciding how you will meet your objectives, it is important to consider a wide array of approaches. This module shows how the IEMS methodology considers a hierarchy of alternatives, which include substitutes, pollution prevention, and wise resource management.

Module 5: Setting Targets and Measuring Success

For those significant environmental aspects where you have set an objective, you will need to develop specific targets that describe how you will achieve your goal and you need to develop ways of measuring that achievement.

Module 6: Developing Operational Controls

For some environmental aspects, you will need to write procedures to ensure that activities are performed in a way that reduces environmental impact. This module lays out how to develop operational controls, measure for success of those controls, and provide corrective action when necessary.

Module 7: Implementing Your IEMS

Effective implementation is essential to getting your IEMS off to a good start. This module helps you plan the IEMS development process and set up environmental management projects for your objectives.

Module 8: Building Organizational Support

The long-term success of your IEMS will depend on solid organizational support. Such support includes developing documentation, meeting training needs, and implementing effective communication and stakeholder involvement processes.

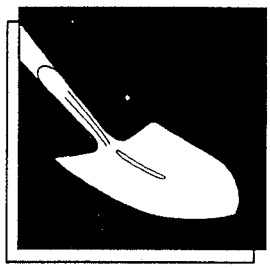
Module 9: Establishing Continuing Improvement

To ensure success and continuing improvement, regular reviews

of your overall IEMS are needed. These reviews include progress made in communication, documentation and developing stakeholders as well as the specific environmental targets. The reviews provide critical information to ensure continuing improvement.

How much work each of the steps entails depends entirely on the scope of work that you decide to undertake. It is not necessary for your IEMS to include all your operations, especially for your first effort. As you gain experience in managing environmental concerns along with your daily operations, you will develop your IEMS further.

MODULE 1: LAYING THE GROUNDWORK



This module contains an overview of Environmental Management Systems, suggestions for how to build internal support for your IEMS, ideas for developing your IEMS management team, and a process for understanding how your company impacts the environment.

Overview of Environmental Management Systems

An **Environmental Management System** (EMS) provides a systematic way to review and improve operations for better **environmental performance**. An EMS can help a company better meet its compliance requirements. It can also help a company use materials more efficiently and streamline operations, thereby reducing costs and becoming more competitive.

☞ **Tip**

An **EMS** is a framework for managing those significant **environmental aspects** you can control or influence.

A commonly used framework for an EMS is the one developed by the International Organization for Standardization (ISO) for the ISO 14001 standard. *Although the EMS described in this Guide is based on the ISO 14001 approach, the process outlined in this Guide may not provide for meeting all the requirements of ISO 14001 certification.* The purpose of this Guide is not to give advice towards certification. It is to demonstrate a technical means of integrating environmental concerns into company management so that businesses can become more effective in reducing their impact on the environment.

☞ **Tip**

Words in **bold type** can be found in the Glossary (Appendix A).

In addition, other guides on the market provide useful

approaches. Developing an IEMS based on this Guide does not imply endorsement by the U.S. EPA.

The five main stages of an EMS, as defined by the ISO 14001 standard, are as follows.

- *Commitment and policy* — top management commits to environmental improvement and establishes a company **environmental policy**.
- *Planning* — the company conducts a review of its operations, identifies legal requirements and environmental concerns, establishes objectives, evaluates alternatives, sets targets, and devises a plan for meeting those targets.
- *Implementation* — the company follows through with the plan by establishing responsibilities, training, communication, documentation, operating control procedures, and an emergency plan to ensure that **environmental targets** are met.
- *Evaluation* — the company monitors its operations to evaluate whether the targets are being met, and, if not, takes **corrective action**.
- *Review* — the EMS is modified to optimize its effectiveness. The review stage creates a loop of continuous improvement for the company (Figure 1-a).

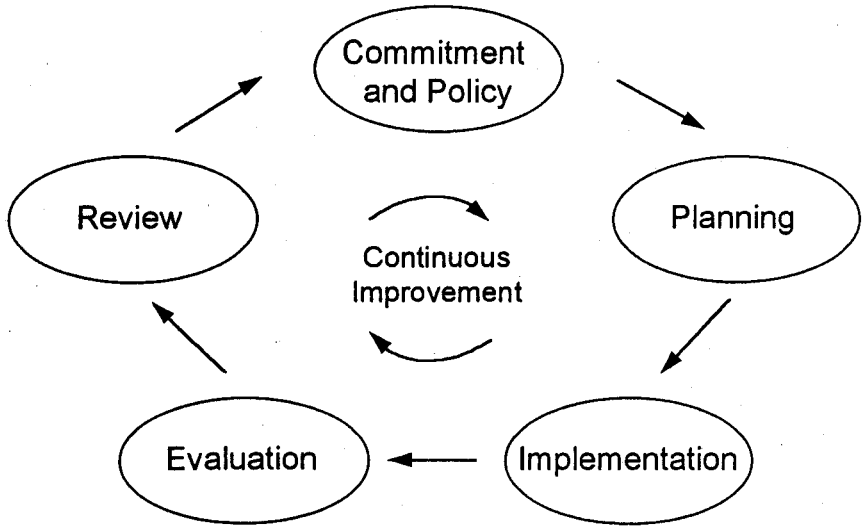
☞ **Tip**

For more information on ISO 14001 EMS, check Appendix G (References and Resources).

☞ **Tip**

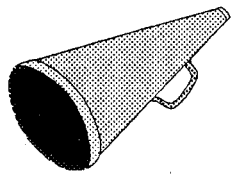
Continuously identifying and reducing risk leads to improved competitiveness and environmental performance.

Figure 1-a. The Continuous Improvement Cycle



The advantage of adopting the DfE Program approach is that it enables your company to consider and plan for managing the environmental risk of your company's products, processes and services. The method outlined in this Guide will help your company compare alternatives to identify the least cost, best performing and lowest environmental impact option. This approach will help your company do the following:

- practice pollution prevention,
- use resources efficiently,
- avoid shifting problems from one waste stream to another,
- understand the risks associated with using both regulated and unregulated chemicals,
- integrate management of worker safety and health requirements with management of environmental concerns,
- practice extended product and process responsibility, and
- manage system change in addressing environmental concerns.



Screenprinters from the SGIA/EPA IEMS Pilot Project have this to say about what they learned:

"That you can have a *system* to achieve environmental improvement. Never gave it much thought before."

"Changed from being reactive to environmental regulations to being more proactive."

"The benefits of having documented operational controls."

"General environmental awareness building across the board; and that you can be bottom-line oriented and environmentally conscious at the same time."
"That the ultimate benefit is improving the environment and improving the bottom line at the same time."

Thus, by using the approach provided in this Guide, you can develop a IEMS that helps you continuously identify and reduce risks to people and the environment. This Guide provides methods to help you consider risk reduction when answering the following questions.

- How does your company impact the environment?
- Which of these environmental impacts are significant?
- How can your company improve its environmental performance?

Building Support for Your IEMS

Both management and employees need to understand not only what a IEMS is, but also why they would want one. This step is designed to get people to think about and discuss the ways in which a IEMS would benefit your company. Even though you may already have management support, it is still important to get employee buy-in to this process.

Through years of working with companies, the DfE Program has learned the importance of building support from participants through open and frequent discussion about mutual concerns.

Set up times to discuss your company's need for a IEMS with key managers and employees. Recording the discussions provides important documentation, which can be used to communicate the benefits of your IEMS to others. One way to record the discussion is to assign someone the task of writing the group's comments on a flip chart, so that everyone can see them for discussion. The following set of general questions will lead you through the discussion.

Discussion Questions

1. Which environmental and worker safety laws and regulations is your company required to follow?
2. How does your company define environmental

performance?

3. Does lack of time or resources prevent your organization from taking charge of its environmental obligations? Are there individuals appointed to be responsible for this function?
4. What is your company's environmental policy?
5. Does your organization know how its environmental objectives relate to its business objectives?[1]

To build support, consider the benefits a IEMS might provide for your company. A more systematic approach to meeting your environmental and business goals might contribute to the following in your company:

- improved environmental performance
- improved worker health and safety
- improved competitiveness
- improved compliance and reduced liability
- fewer accidents
- lower insurance premiums
- improved public image
- enhanced customer trust
- better access to capital
- improved internal communication
- improved company morale
- reduced operating costs

It will be helpful at this point to create a worksheet comparing the expected costs and benefits of developing a IEMS.

☞ Tip

To help get facility-wide buy-in to the IEMS process, find the workers who are most enthusiastic with the process and recruit them to spread the word among their peers. Commitment from top management is essential, but you also need promoters at all levels of your company.

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1 Adapted from: *Environmental Management Systems: An Implementation Guide for Small and Medium-Sized Organizations.* Ann Arbor, MI: NSF International, November 1996, p.3.

Worksheet 1-1 provides some general categories of costs and benefits. When making your comparison, provide specific examples from the discussion.

Assigning Responsible Persons

Designate, as soon as possible, the Management Representative, the IEMS Coordinator, and a Committee who will be responsible for promoting and developing your IEMS. If you have a very small company, these may all be the same person! However, it is still important to designate who will be responsible for various activities. Worksheet 1-2 provides a means to document the responsible persons. This worksheet can be placed in your Company IEMS Manual (see the *Company Manual Template*).

Worksheet 1-1: Costs and Benefits of Developing and Implementing an IEMS[2]

Costs	Benefits
▸ Staff/employee time for: collecting information reading and understanding this Guide preparing worksheets facilitating IEMS sessions participating in IEMS development ▸ Possible consulting assistance ▸ Training of personnel in new procedures ▸ Technical resources to analyze environmental impacts and improvement options ▸ Resources required to make changes	▸ Improved environmental performance ▸ Expected increased efficiency/reduced cost of materials ▸ New customers/markets ▸ Enhanced employee morale ▸ Expected savings in compliance and overall compliance monitoring and assessment, and record-keeping requirements due to changes in materials used ▸ Reduced **waste** disposal/treatment costs ▸ Fewer regulatory requirements
Contact Person:	Date completed:

Worksheet 1-2: IEMS Responsibilities

IEMS Function	Person	Regular Position
Management Representative		
IEMS Coordinator		
IEMS Committee		
Contact Person:		Date Completed:

Corresponds to RESP-01 in the *Company Manual Template*.

[2]Ibid, p. 5.

In addition, Figure 1-b shows the job functions and skills that would make a strong contribution to your IEMS team. Small companies might not have a person for each function identified on the table. The list is provided to identify skills that would be useful, not to suggest that a company would need all of these on a team.

Figure 1-b. Functions to Include in Your IEMS Team

Company Function	**Expertise Brought to Project Team**
Production	Management of environmental aspects of production
Maintenance	Management of environmental aspects of equipment maintenance
Facilities Engineering	Management of environmental aspects of new construction and installation/ modification of equipment
Storage/Inventory	Management of environmental aspects of raw material and product storage and in-facility transportation
Shipping, Receiving, Transportation, Logistics	Management of environmental aspects of shipping, receiving, and transportation
Product Design	System for examining environmental aspects of new designs
Quality	Quality management system, including document control procedures
Human Resources	Training on environmental issues Inclusion of environmental incentives in performance measurement system
EH&S	System for complying with environmental regulations Management of environmental records
Purchasing	System for procurement (including screening of suppliers, material composition of components)
Sales/Marketing	Environment-related commitments to customers
Public Relations	System for communicating with public on environmental issues
Accounting/ Finance	System for tracking environmental costs of operations

Planning the Process

To effectively implement your IEMS, you will need to set up a plan for getting the work done. This plan will be unique to your company. You will identify the steps to take, in the appropriate order; the decisions that will need to be made; and the resources and schedules for accomplishing the tasks. Start out by considering the following points as you plan for your IEMS development:

- Determine what level of management involvement is required and what decisions will be needed from both middle and senior management.
- Set a deadline for developing your IEMS and establish a schedule. (See worksheet at the end of this module.)
- Estimate a budget.
- Determine how you will document your IEMS.

If you have never developed an IEMS before, estimating resources and time can be difficult. You will need to create a schedule and estimate resources for completing your IEMS. As you begin to work on each module, you may want to identify intermediate steps for which you will set target completion dates. At some points, you may need to alter the overall schedule. Worksheet 1-3 will assist you in developing and tracking this plan. As you go through each module, revisit this worksheet and list who is participating in each task and your estimated budget and schedule. Also, Worksheet 1-4 will help you identify and document the persons responsible for different parts of the IEMS and the resources needed to support their effort. You may not be able to completely fill out these budget and resource worksheets at the beginning of this process. In addition, the items in the worksheet blocks may change as you work your way through the IEMS process. These worksheets only present ideas to get you started.

Worksheet 1-3: IEMS Development Schedule and Resources Worksheet

Module	Participants	Budget	Target Completion
Laying the Groundwork: Identifying Environmental Aspects			
Intermediate steps: (As appropriate)			
Making the Commitment: Creating a Policy Statement and Determining the Scope			
Intermediate steps: (As appropriate)			
Determining Significant Environmental Aspects and Setting Objectives			
Intermediate steps: (As appropriate)			
Setting Targets and Measuring Success			
Intermediate steps: (As appropriate)			
Developing Operational Controls			
Intermediate steps: (As appropriate)			
Evaluating Alternatives			
Intermediate steps: (As appropriate)			
Implementing Your IEMS			
Intermediate steps: (As appropriate)			
Setting Up Environmental Management Projects			
Intermediate steps: (As appropriate)			
Establishing Continuing Improvement			
Intermediate steps: (As appropriate)			
Contact Person:	Date Completed:		

Worksheet 1-4: Persons Responsible for IEMS Development

Roles	Individual(s) Responsible	% of Time Designated	Budget
"Management representative" having responsibility for implementing the IEMS (in small businesses, this could be the owner).			
IEMS Coordinator			
IEMS Team Participants			
Identifying and determining significance of environmental aspects.			
Identifying and determining applicability of legal and other requirements.			
Competency-based training.			
Operational controls.			
Emergency preparedness and response.			
Monitoring and measurement of "key characteristics" of operations and activities that can have significant environmental impacts (i.e., the "significant environmental aspects.").			
Periodic evaluations of environmental compliance.			
Handling and investigating non-conformance with the EMS.			
Records management.			
Internal EMS audits.			
Contact Person:		Date Completed:	

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

Gathering Information and Identifying Environmental Aspects: Understanding Your Company's Possible Impacts

The work in this step mostly involves gathering and organizing information about your company's activities. Information gathering involves four activities:

- map your company's activities and processes,
- identify inputs and outputs for each activity and process step,
- identify the environmental aspects associated with each input and output, and
- identify regulatory and other requirements.

The process of identifying environmental aspects is best undertaken through group discussion with all levels of production employees, office staff, and managers. This helps to gain insight through different perspectives, and it engages everyone in the process of understanding the environmental component of your daily activities.

An **environmental aspect** is an element of your company's activities, products, or services that can affect the environment. Environmental **impacts** are the changes to the environment whether adverse or beneficial that result from your company's activities, products or services. Most elements of your business operations will have environmental aspects, intended or unintended.

For example, an unintended aspect of using a cleaning solvent may be that there are **volatile** (airborne) emissions produced during use. The "impact" of these emissions may be hazardous exposure to workers or the community or a contribution to smog formation. Another example is the business activity of making paper copies. The toner cartridges contain chemicals that could interact with the environment if they are not disposed of properly. The used toner cartridges with chemical waste would



Each DfE project begins with a simple mapping exercise to identify possible environmental concerns. Informed participants then select a priority concern that becomes the focus of the DfE project.

☞ **Tip**

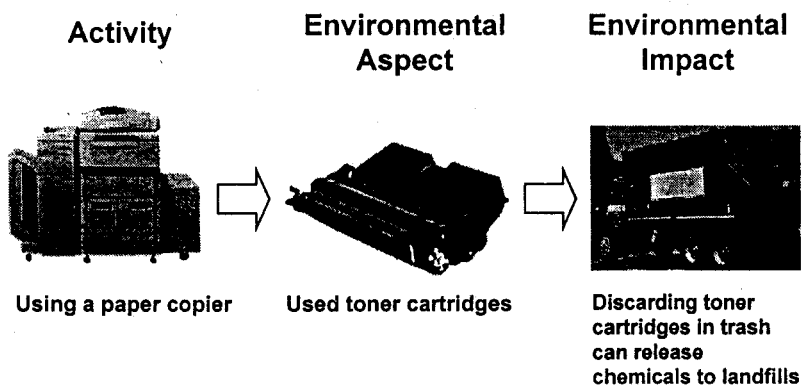
An environmental **aspect** is any element of your company's activities, products, and services that has the potential to affect the environment.

be an environmental aspect. The release of these chemicals into a land fill would be an environmental impact. Figure 1-c lists examples of environmental aspects and their potential impacts, and Figure 1-d graphically shows the relationship between activities, aspects, and impacts.

Figure 1-c. Examples of Environmental Aspects and Associated Impacts

Environmental Aspects	**Potential IMPACTS of Each Aspect**
Metals discharged to POTW	Contamination of aquatic habitat and drinking water supply
VOC emissions	Contribution to smog; worker or community exposure to volatile organic compounds (VOCs)
Scrap generation	Degradation of land, habitat, water supply
Solid waste generation	Habitat destruction, drinking water contamination from landfills, wasted land resources
Fresh water use	Depletion of natural resources
Electricity use	Contribution to global warming; degradation of air quality by electric generating plants
Exposure to chemicals during business activities	Harm to health of workers, neighbors, wildlife or plant life

Figure 1-d. How an Activity Becomes an Impact



Step 1: Develop a Process Map of Your Company's Activities and Processes

The first step in identifying environmental aspects of your business is to develop a map of your company's processes, products and services. First, categorize your business activities into areas or steps in the process, so that you can review them one by one. Some typical areas to consider might include:

- Receiving Raw Materials
- Storing Raw Materials
- Manufacturing Process, Step 1
- Manufacturing Process, Step 2
- Manufacturing Process, Step 3
- Packaging
- Process Clean-up
- Waste Disposal
- Office
- Building Maintenance
- Shipping Product
- Transportation (including employee, sales, and management staff, parking)
- Optional: map customer and supplier activities and processes that directly relate to your company's activities, products and processes

Use this list of areas to develop a process map describing the order in which activities take place in your company. Some areas may need their own map; others could be parts of a larger map. Figure 1-e shows a generic process map of a manufacturing company that might help you to set up your own map. Worksheets EA-01a and EA-01b in the *Company Manual Template* also provide a way to document your company's operations.

Internet Help

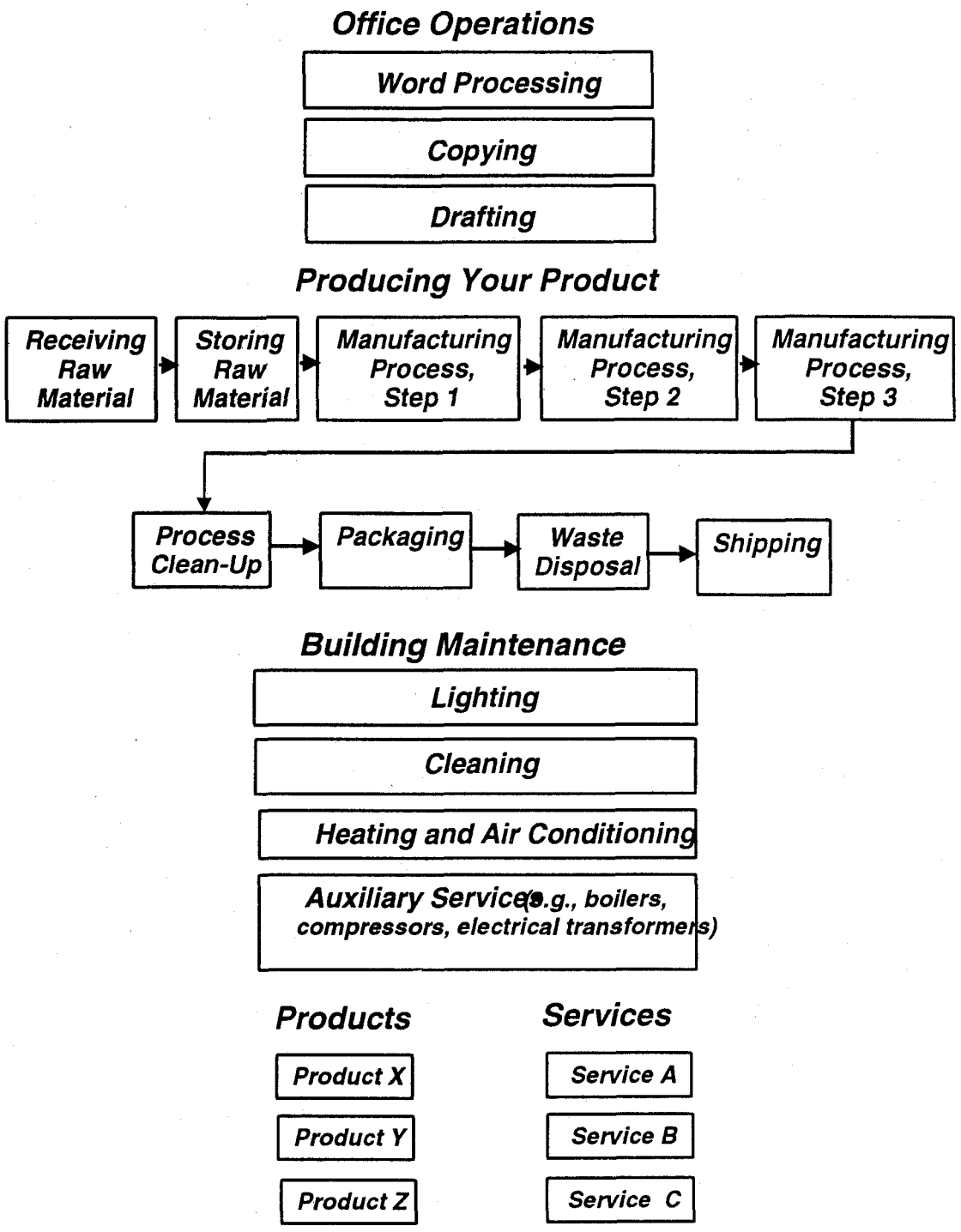
Visit the DfE website for more tools related to process mapping.

www.epa.gov/dfe

☞ Tip

These technical sections are best developed through group discussions. There is no "right" way to build these lists. The process, however, must make sense to you and be documented so that you can review it or change it later.

Figure 1-e. Generic Process Map for Business Activities

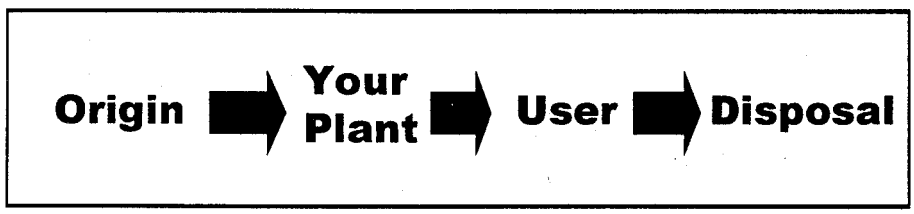


You will notice that two areas of activities, office operations and building maintenance, have boxes that are separate rather than being part of a sequence. This is because the activities identified under these areas are not related sequentially. Under the area "Producing Your Product," the activities are connected in steps required to produce a product or service. This order will be important to understand later if you decide to work on an aspect that is part of a sequence of steps.

☞ **Tip**
Appendix H contains full-page versions of the blank worksheets.

In addition to the process steps laid out in your map, you should consider the environmental aspects of your products and services. For example, does your product or its packaging have potential impacts on the environment? If so, there may be opportunities to form partnerships with customers to work on making changes that reduce the impact. As shown in Figure 1-f, many companies are extending their responsibility to consider the upstream impacts of their materials choices and the downstream impacts of consumer use and disposal of products.

Figure 1-f. Product X — Extended Responsibility



Step 2: Identify the Inputs and Outputs of Each Activity

The next step in identifying environmental aspects is to identify the inputs and outputs of each box in the process map you developed in Step 1. Among those inputs and outputs will be some that have environmental effects. Figure 1-g shows a generic step in a manufacturing process. Figure 1-h illustrates this concept with an example of a business activity (paper copying) that is an office activity rather than part of an operational sequence. The second example, shown in Figure 1-i,

shows the process step of press cleaning in printing operations at ABC company. Figure 1-j shows graphically the general inputs and outputs of a company's products and services.

Figure 1-g. Input-Output Diagram for a Step in a Manufacturing Operation

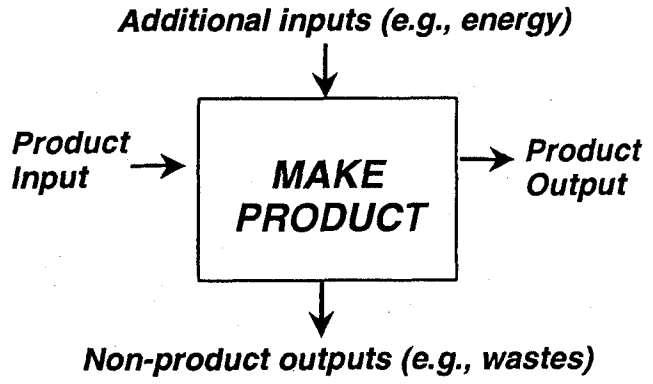


Figure 1-h. Input-Output Diagram for a Copier

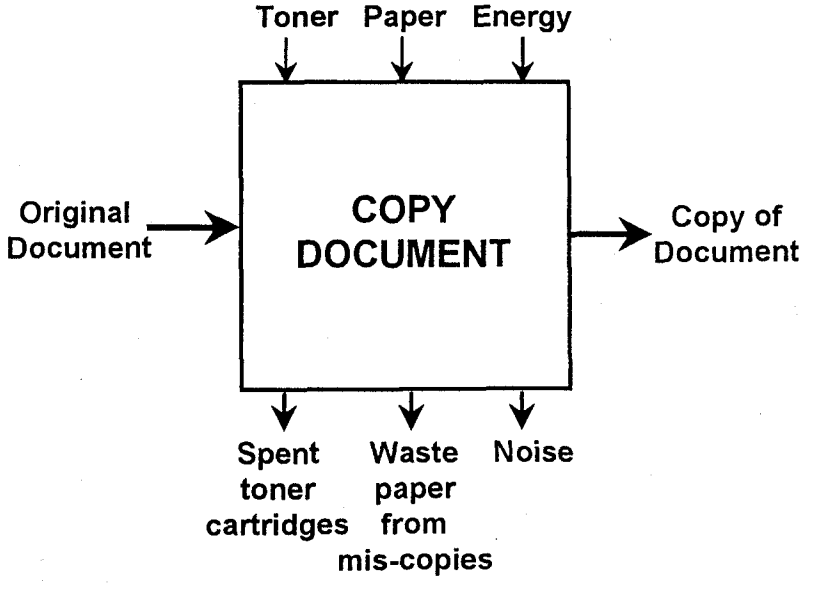


Figure 1-i. Input-Output Diagram for Cleaning a Printing Press

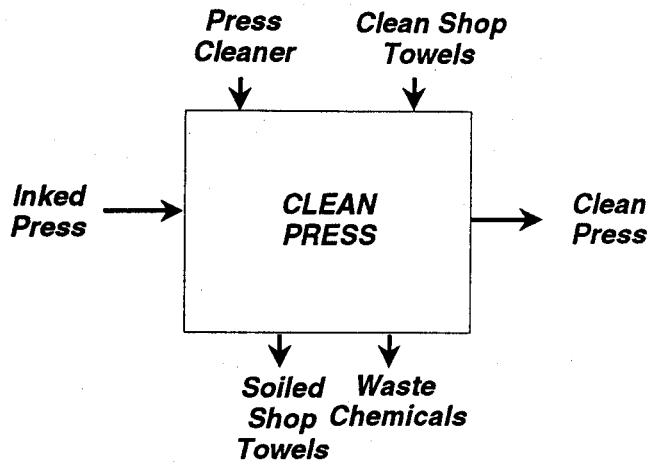
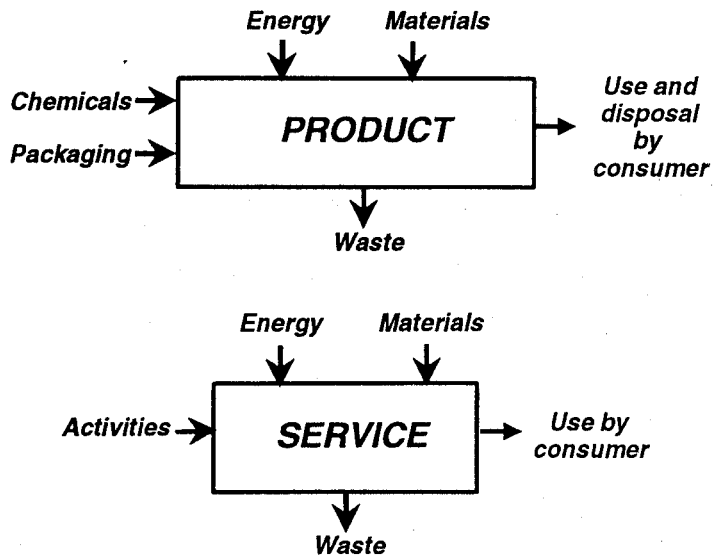


Figure 1-j. Inputs and Outputs of a Company's Products and Services



Step 3: Identify environmental aspects of each activity

Next you will identify environmental aspects associated with each input and output. Using your process map developed in Step 2, identify the environmental aspect of each input and output. Keep the following key points in mind when identifying the environmental aspect of a particular activity.

- Can it interact (beneficially or harmfully) with anything in the environment?
- Can it be toxic or hazardous to humans or anything in the environment?
- Does it use natural resources?
- How is it disposed of?
- If a product, how will it be used and disposed of by the consumer?

Use Worksheet 1-5 to help you list each process step and its associated environmental aspect. Appendix H contains a blank copy for your use.

Worksheet 1-5:* Identifying Environmental Aspects

Input/Output	Environmental Aspect (Quantify if available)	Environmental Impact
Office Activities		
Paper (In)	Use of paper	Use of natural resources
Energy & fuel (In)	Use of energy	Use of natural resources; air quality degradation
Toner (In)	Harmful chemicals	Health and environmental effects**
Documents (In)	Solid waste	Degradation of land, habitat, drinking water
Waste paper (Out)	Solid waste	Degradation of land, habitat, drinking water
Used Toner (Out)	Solid and chemical waste	Degradation of land, habitat, drinking water
Odors (Out)	Production of odors	Indoor air quality
Manufacturing Process		
Press cleaner (acetone, toluene, MEK, isopropyl alcohol blend) (In)	Chemicals that are toxic to humans or the environment	Health and environmental effects*
Wipers (In)	Materials that are toxic to humans or the environment	Health and environmental effects*
Energy & fuel (In)	Use of energy	Use of natural resources; air quality degradation
Soiled wipers (Out)	Production of hazardous waste, solid waste	Degradation of land, habitat, drinking water*
Waste chemicals (Out)	Production of hazardous waste, solid waste	Degradation of land, habitat, drinking water*
Air releases of press cleaner (Out)	Production of air pollutants	Degradation of air quality*
Products and Services		
Product X: Chemicals	Chemicals that are toxic to humans or the environment	Health and environmental effects*
Materials	Materials that are toxic to humans or the environment	Health and environmental effects*
Packaging	Production of hazardous waste, solid waste	Degradation of land, habitat, drinking water
Waste	Production of hazardous waste, solid waste	Degradation of land, habitat, drinking water
Energy use	Use of energy	Use of natural resources; air quality degradation
Service X: Chemicals used	Chemicals that are toxic to humans or the environment	Health and environmental effects*
Waste products	Production of hazardous waste, solid waste	Degradation of land, habitat, drinking water
Energy use	Use of energy	Use of natural resources; air quality degradation
Contact Person:		Date Completed:

*Use the blank form in Appendix H for your data, then use the information to fill in EA-02 in the *Company Manual Template*. ** See Module 3 for information on chemical effects.

Step 4: Identify your legal and other requirements

The last step in identifying environmental aspects is to identify environmental legislative and regulatory requirements that pertain to your business activities, products, and services. Regulated concerns that apply to your business should be included in your system of environmental programs because your IEMS will integrate all of your company's efforts to manage environmental concerns.

State and local legal requirements, in addition to federal, need to be considered. Often states administer federal environmental and occupational safety and health regulatory programs and may have stricter and/or different requirements than federal regulations.

You can obtain information on regulatory requirements from a variety of sources. State or city departments of environmental protection might be able to assist you in finding this kind of information. For example, state technical assistance programs are often excellent resources and often can provide one-on-one consultation. In addition, public information offices of both the Environmental Protection Agency (EPA) and the Occupational Health and Safety Administration (OSHA) of the Department of Labor (DOL) can help provide publications that explain regulations pertinent to your company's activities. Publications by the DfE Program at EPA and EPA's Office of Enforcement and Compliance Assurance (OECA) also identify federal regulations affecting certain industries. Appendix G gives full citations of the DfE publications, addresses for some resources, and describes how to obtain them. You can also visit the DfE Web site at www.epa.gov/dfe. Regulatory information is also available at the websites of many agencies.

☞ Tip

It is helpful to begin identifying regulatory requirements by making a list of those regulations that you know affect your company. Searching for additional information can take time. Any newfound regulatory requirements can be added into your IEMS at a later date.



☞ Tip

Even regulations that may not directly apply to your business may contain important information about the environmental impacts associated with your type of business.

Worksheet 1-6 will help you organize your search of regulations that affect your business. In many cases, very small businesses are exempt from some regulations. Still, the problems addressed by the regulations may affect your business and may be concerns you would want to address in your IEMS. Thus, it is worthwhile to familiarize yourself with regulations, just to identify concerns and determine whether any of them apply to your operations. Use Worksheet 1-6 to keep track of regulations that apply to your business.

Worksheet 1-6*: Regulations

Regulatory Agencies	Regulations That Apply to My Business Sector	Business Operations Potentially Affected	Does it Apply to My Business?
Contact Person:		Date Completed:	

*Corresponds to Table LR-01 in *Company Manual Template*.

In addition to regulations, industry codes of practice and other non regulatory guidelines can help point to environmental aspects of your business activities. Your trade association also may be able to help identify useful publications.

The following case study shows how "Company A" set up a process for creating an environmental management system and some of the benefits of doing so.

Case Study: Company A

EMS Development

Company A is a 20-person manufacturer of large custom metal machine parts for industrial customers. To initiate its EMS, the company formed a small EMS implementation team that includes the managers of quality, purchasing, and human resources and is led by the owner's son. This team developed the environmental policy for review and approval by the owner, and, equally important, set up a structure for involving all employees in the EMS process. Employees receive general environmental awareness training during some of the company-wide Friday meetings, and have been involved in identifying environmental problems and solutions in their areas of responsibility.

Company A's comprehensive approach to environmental management yielded immediate results. After identifying oil usage as a significant environmental aspect, a team of workers and managers identified faulty gaskets as the primary cause of oil leaking from the machines. By replacing these gaskets, the company cut its oil use by 50%. This change, as well as more general improvements in work environment and worker safety, caused the local environmental enforcement agency to reclassify Company A as a non-hazardous waste generator (it had been classified as a hazardous waste generator). The company also reports significant improvements in the environmental awareness of management and workers; though less tangible, this change in attitude may prove equally significant over the long run.

College + University Management System Implementation Guide. July 2001.

C/U-EMS IMPLEMENTATION GUIDE ELEMENTS

Number	Element
Module 1:	**Policy**
1.1	Environmental Policy
Module 2:	**Planning**
2.1	Environmental Aspects and Impacts
2.2	Compliance
2.3	Objectives and Targets
2.4	Operational Controls
Module 3:	**Implementation**
3.1	Roles and Responsibility
3.2	Communications
3.3	Training
3.4	EMS Document Control
3.5	Emergency Response and Preparedness
Module 4:	**Review and Improvement**
4.1	Measurement and Monitoring
4.2	EMS Nonconformance and Corrective Action
4.3	Corrective and Preventive Action for Compliance
4.4	Records
4.5	EMS Audits
4.6	Administration Review

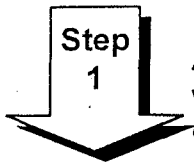
Nomenclature and concepts for each element were generally derived from the International Standard for Environmental Management Systems, ISO 14001; however, the Guide does not strictly adhere to all aspects of ISO 14001. In particular, the Guide focuses on (1) creating a policy, (2) understanding and prioritizing all environmental aspects, (3) establishing compliance objectives or source reduction for priority aspects, and (4) taking actions and measuring results for each objective. The Guide is not an EMS primer or general guidance document. Guide users should be familiar with basic EMS concepts or review one or more of the numerous existing general EMS reference documents. (See "Get Help!" at the end of this section.) A glossary of EMS terms is provided in Appendix B. Terms used throughout the Guide that are important to understand are:

- **EMS Manager:** C/U employee appointed by, and with the support of the C/U administration for initiating and leading EMS implementation
- **EMS Team:** Core group of people comprised of C/U staff, faculty, students, departmental heads, and administrators responsible for day-to-day EMS activities; while C/U environmental, health, and safety staff may lead the EMS initiatives, broad representation is critical to EMS success

- **EMS Participants:** Anyone involved with implementation of EMS elements, including aspect and impact or compliance review, achieving objectives and targets, and collecting measurement and monitoring data

- **EMS Steering Group:** Small group of EMS Participants and C/U administrators providing (1) guidance via response to EMS briefings and (2) feedback via administration review to the EMS Team to ensure progress, effectiveness, and wise use of EMS resources

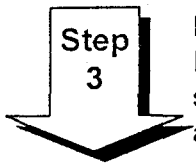
GETTING STARTED WITH THE C/U EMS IMPLEMENTATION GUIDE



Obtain Top-Level Commitment.
An EMS without commitment from the highest level of the administration is like a car without a driver – it will not run. Successful EMSs are characterized by top-level commitment demonstrated through words and actions.



Identify An EMS Manager Responsible for Coordinating EMS Efforts.
The EMS Manager in turn should form an EMS Team including other personnel familiar with the institution's operations, material use, and waste management. At least one person on the EMS Team should have good spreadsheet skills (for example, Microsoft Excel), which will streamline charting of key EMS performance metrics.



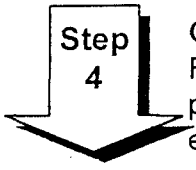
Identify and Discuss Important EMS Features.
EMSs are as unique as the C/Us that create and implement them. The EMS Team should meet to identify and discuss important EMS features that will guide the creation and implementation efforts. Several examples are provided below.

- *Continual Improvement.* An EMS should feature continual improvement through "plan-do-check-act" strategies that lead to more efficient EMS implementation and better environmental performance.

- *Compliance.* An EMS should, at a minimum, incorporate a systematic approach to maintaining compliance. For C/Us with prior regulatory issues, compliance may be of primary concern within the EMS. In any case, C/Us should strive to move towards exceeding compliance obligations.

- *Emphasis on Pollution Prevention.* When developing options for achieving objectives and targets, action plans that prevent pollution through source reduction should be favored.

- *Results-Oriented.* Although C/Us will create documentation during EMS implementation, the focus of the EMS should be on achieving results, that is, measurable or demonstrable environmental performance improvements.



Communicate the EMS Initiative to Faculty, Students, and Staff and Invite Input.
Faculty, students, and staff should be aware of the EMS implementation effort, its purpose and elements, and how individually, they contribute to achieving environmental performance objectives.



Conduct A Preliminary Review Or Gap Analysis.
A gap analysis should be performed to identify: (1) current environmental management practices that can "evolve" into EMS elements and (2) missing EMS elements. Consider using the Campus Consortium for Environmental Excellence (C2E2) EMS Self-Assessment Checklist (see the "Get Help" bullet on page 6 of this Introduction) to perform the gap analysis for your institution. A "crosswalk" between the C2E2 EMS Scorecard and the Guide is included at the end of this introduction. This crosswalk will help you identify the specific Guide elements that can fill gaps in your EMS.

In addition to the gap analysis, consider benchmarking your EMS plans by contacting other C/Us. (See C/U list on page 2 of this introduction.)



Determine the Scope for the EMS
Every C/U will have unique circumstances that dictate the extent and focus of its EMS. Therefore, after completing Step 5 above, the EMS Team should step back and make decisions regarding the scope of the EMS and how best to implement the initiative. Specifically, the EMS Team should consider issues such as:

- Should the EMS cover both environment and health and safety issues?
- How pertinent is the ISO 14001 EMS model to our C/U?
- Do we need to tackle the whole C/U at once or build momentum with selected departments and activities before expanding?



Begin Implementing Guide Elements
Steps 1 through 5 lay the foundation for actions to construct the EMS. The C/U EMS Implementation Guide contains the minimum elements needed for a functioning EMS. Creating and implementing an EMS is a challenging endeavor. Although some C/Us may choose to implement all elements of this Guide as part of a single effort, experience implementing EMSs at other types of organizations suggests that momentum can be gained by implementing the following elements first:

EMS elements to consider implementing first:

- Element 1.1 Environmental Policy
- Element 2.1 Environmental Aspects and Impacts
- Element 2.2 Compliance
- Element 2.3 Objectives and Targets
- Element 3.1 Roles and Responsibilities
- Element 3.2 Communication
- Element 3.3 Training
- Element 4.1 Measurement and Monitoring

Full implementation of the above elements typically requires 6 to 9 months. The remaining Guide elements can then be implemented gradually over the following 12 months. The implementation tips presented below should get your EMS implementation efforts off to an efficient start:

EMS Implementation Tips:

- **Avoid "reinventing" procedures for the EMS.** Leverage components of other management systems and programs; for example, adapt existing training programs to include environmental training or model EMS documentation and document control procedures on document control used for other C/U operations.

- **Address priority areas first.** Although seemingly obvious, EMSs often stall after the organization expends a significant amount of effort cataloguing all its numerous environmental aspects. Instead, selecting a few top priority aspects and creating and executing action plans mitigating those aspects will achieve results quicker and build momentum that will lay the groundwork for a sustainable EMS.

- **Set reasonable goals.** Develop goals that are "do-able" within 12 months and make sure that several are achievable within 6 months; build momentum for your C/U's EMS and avoid setting over ambitious goals that may frustrate or stall EMS Participants.

- **Communicate!** Communication cannot be overemphasized: publicize efforts, trumpet successes, build support, and keep administrators involved.

- **Get help!** C/U-specific and general EMS assistance can be obtained from a variety of organizations and documents including the following:

  - U.S. EPA New England (Region I) Colleges and Universities Home Page (http://www.epa.gov/region01/steward/univ/index.html)

  - Environmental Management Systems: An Implementation Guide for Small and Medium-Sized Organizations, Second Edition, NSF International, 2001. (www.nsf-isr.org/publications/iso_14000.html)

  - Integrated Environmental Management Systems: Implementation Guide, EPA 744-R-00-011, 2000. (www.epa.gov/opptintr/dfe/tools/ems/ems.html)

  - Campus Consortium for Environmental Excellence (C2E2) EMS Self-Assessment Checklist, 2000. http://esf.uvm.edu/c2e2

  - University of Massachusetts Lowell EMS Service Program; contact Matthew_Donahue@uml.edu

Exhibit 2. ISO 14001—EMS Summary Action Plan

	1995		1996				1997				1998	
	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter
Policy	Establish Define Corporate EHS Review Committee/ Sub Committee	Develop 5 year strategic plan and Communication Plan Identify Goals and Management System	Implement Planning Process at Operations		Implement Planning Process at Subsidiaries International		Integrate EHS Plan into Business Plans at Plants Operational Subsidiaries		Review Measurements to Improve Management Systems and Plan		Identify New Goals and Amend Strategic Plan/Management System	
Planning	Define EHS Roles and Accountability of Corporate, Subsidiaries Operations/Plants	Establish EHS Focal Point for Business Teams and Subsidiaries	Determine Organizational Needs at Plant Sites per Plans and Requirements		Implement Organizational Changes		Define EHS Career Paths		Implement EHS Performance Review Process		Reevaluate Organization for Effectiveness	
Implementation & Operations	Review/Develop EHS Policy	Finalize and Communicate EHS Policy Worldwide	Develop Process to Track EHS Issues at all Levels				Update Policy Annually or as Needed per EHS Issues					
Documentation & Information Management	Review Existing EHS Standards Throughout Company		Develop Consistent Minimum Requirements for all Sites Worldwide		Communicate and Implement Requirements		Develop Tools And Guidance to Assist in Implementation		Measure Effectiveness of Requirements and Implementation		Update and Revise Annually	
Checking & Corrective Action	Develop Approved Hazardous Waste Vendor List	Define Minimum EHS Programs per Requirements	Review Existing Best Practices and Audit Findings to Prioritize EHS Program Needs		Implement Guidance and Tools to Develop Program				Develop and Implement EHS Program		Assess Program Performance Through Measurements and Audits	
Management Review	Senior Management EHS Awareness Training		Conduct Detailed Training Needs Assessment, Integrate H&S into Environmental Seminar		Prioritize Training Needs Match with Requirements		Driver Training		Delegate to Subsidiaries/Operations		Assess Effectiveness	

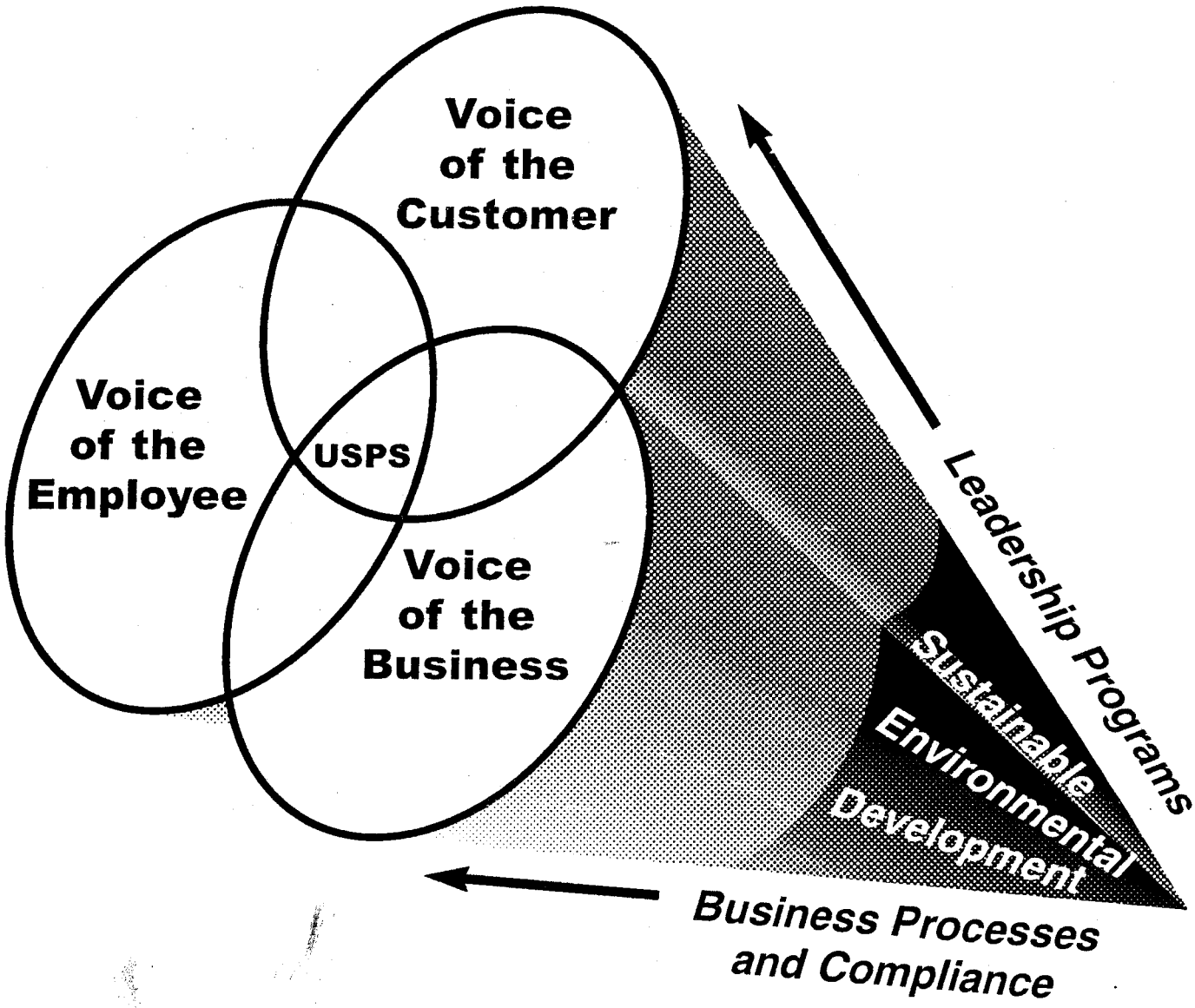
Key

■ Top Priority Issues/Programs ■ 1995 ■ 1996 ■ 1997 ▒ 1998

Sample timeline from "ISO 14001 EMS Implementation Planning" by Deborah A. Tracey & Mary Jo H. Wendell

United States Postal Service
Capital Metro Operations

Strategic Plan
1997 - 2000



United States Postal Service
Capital Metro Operations
16501 Shady Grove Road
Gaithersburg, MD 20898-9998

John E. Potter
Manager, Capital Metro Operations

John H. Bridges III
Area Environmental Compliance Coordinator

This Plan has been prepared to establish and formally communicate the strategic environmental management direction of Capital Metro Operations for the remainder of the 1990s. In the interest of continuing improvement and support, suggestions on the matters within may be forwarded to:

John H. Bridges III
Area Environmental Compliance Coordinator
900 Brentwood Road, NE
Washington, DC 20066-7700

Foreword

In 1997, The Capital Metro Operations Strategic Environmental Management Plan was developed based on guidance from the Environmental Management Policy (EMP). This strategic plan provides guidance to all Postal Service employees, contractors, and customers to assist them in becoming more proactive when addressing environmental issues. It provides awareness of our commitment to correct past deficiencies and to preserve and protect the environment placed in our care.

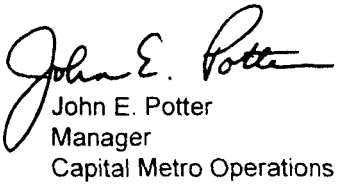
Within this past year, we have made great strides toward achieving our short-term goals of enhancing environmental awareness; yet, much remains to be accomplished. As part of our continual improvement process, we have just completed a thorough evaluation of our performance indicators and have made adjustments, where necessary, to allow us to stay in compliance with the myriad of laws and regulations that apply to Capital Metro Operations, maintain our impetus, and remain proactive.

The key to our success for moving beyond compliance is developing and implementing an environmental management system using a standardized approach that provides for consistency and continual improvement. The framework for this plan for continual improvement is an Environmental Management System (EMS). The EMS is based on ISO 14001, the international standard for environmental management systems. The elements of ISO 14001 and CustomerPerfect! integrate our operational commitments and our commitment to environmental stewardship, which will benefit the Postal Service and its customers for decades to come.

We can all feel a sense of accomplishment as we reflect upon where we were at this time just 16 months ago. Yet, I continue to seek your assistance in a collective effort toward sustainable development at a time when we are confronted with new challenges and opportunities. I challenge each of you to incorporate CustomerPerfect! and to champion a new culture of environmental sustainability to accomplish our environmental targets.

While laws are written to require us to exercise sound stewardship over the environment we control, I firmly believe that it is not the law that should drive our actions; rather, we should do what is right for our business, our employees, our community, and our customers.

Through environmental quality assurance reviews of our key processes, associated environmental impacts are identified and programs are developed to address them. This Strategic Plan can guide our actions but only our commitment will permit us to reach and achieve our goals. You have met the challenge in the past and I know you will continue to do so in the future.



John E. Potter
Manager
Capital Metro Operations

Supporting the Guiding Principles

Capital Metro Operations Strategic Environmental Management Plan recognizes protecting the environment and the health and safety of our employees, our customers, and the communities we service as the principal goal that supports *CustomerPerfect!*. The foundation of this plan is the United States Postal Service environmental policy. The following seven guiding principles, signed by Postmaster General Marvin Runyon in September 1995, are the hallmark for environmental protection for the Postal Service.

Policy

The United States Postal Service is committed to provide employees and customers with a safe and healthy environment. Environmental protection is the responsible thing to do and makes for sound business practices.

Guiding Principles

- ❑ We will meet or exceed all applicable environmental laws and regulations in a cost-effective manner.
- ❑ We will incorporate environmental considerations into our business planning processes.
- ❑ We will foster sustainable use of natural resources by promoting pollution prevention, reducing waste, recycling, and reusing materials.
- ❑ We will expect every employee to take ownership and responsibility for our environmental objectives.
- ❑ We will work with customers to address mutual environmental concerns.
- ❑ We will measure our progress in protecting the environment.
- ❑ We will encourage suppliers, vendors, and contractors to comply with similar environmental protection policies.

Marvin Runyon
Postmaster General
September 1995

Introduction

Providing focus and direction for developing strategies.

This Plan provides direction for application of the Capital Metro Operations environmental guiding principles in an Environmental Management System (EMS) that fosters continual improvement of environmental performance and management within the United States Postal Service (USPS). The following are the vision and mission of the Capital Metro Operations EMS:

VISION
CustomerPerfect!
...first time, every time.

MISSION
Provide the most effective environmental support and protection measures available to our employees, facilities, equipment, and environment

which will provide focus and direction for developing strategies, which are implemented through the following

Leadership Programs

- Underground Storage Tanks
- Clean Air Act Amendments
- Hazardous Chemicals
- Paint Spray Operations
- Mail Transport Equipment
- Recycling & Pollution Prevention

Compliance Programs

- Regulatory Outreach
- Sensitivity to State & Local Regulators
- Awareness Training
- Quality Assurance Reviews
- Energy & Water Conservation

required by
Environmental Management Policy (EMP) and supporting environmental requirements to successfully ensure USPS compliance.

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Why a Strategic Plan?

Capital Metro Operations is the champion for change within the USPS for fundamental business issues, including environmental. Various key stakeholders, including the USPS Headquarters, the Environmental Protection Agency (EPA), and the U.S. Congress, have a significant impact on USPS strategies for addressing environmental issues. In this environment, the USPS Capital Metro Operations must provide vision, leadership, and continual improvement for USPS mail processing and delivery operations to maintain our position as a leading mail service organization.

Repeatedly during the USPS's long history, there have been those who have stopped for a historical moment to try to see what others could not, to look ahead where others had not. It is with this concept that Capital Metro Operations has looked into the future and envisioned the *CustomerPerfect!* goals for the year 2000.

This Strategic Environmental Management Plan was developed, based on a historical as well as a forward-thinking perspective.

This Strategic Environmental Management Plan was developed, based on a historical as well as a forward-thinking perspective, to assist Capital Metro Operations in responding to the dynamic USPS environment. Since environmental management and compliance requirements are constantly changing, and often unpredictable, tools are needed to understand how to respond to these changes. This plan provides tools such as process outlines and action plans for ensuring and moving beyond compliance.

Where Are We Going?

By recognizing that operational, economic, environmental, and social goals are integrally linked and by having a *CustomerPerfect!* strategy that reflects that interrelationship, the USPS is providing for future sustainability.

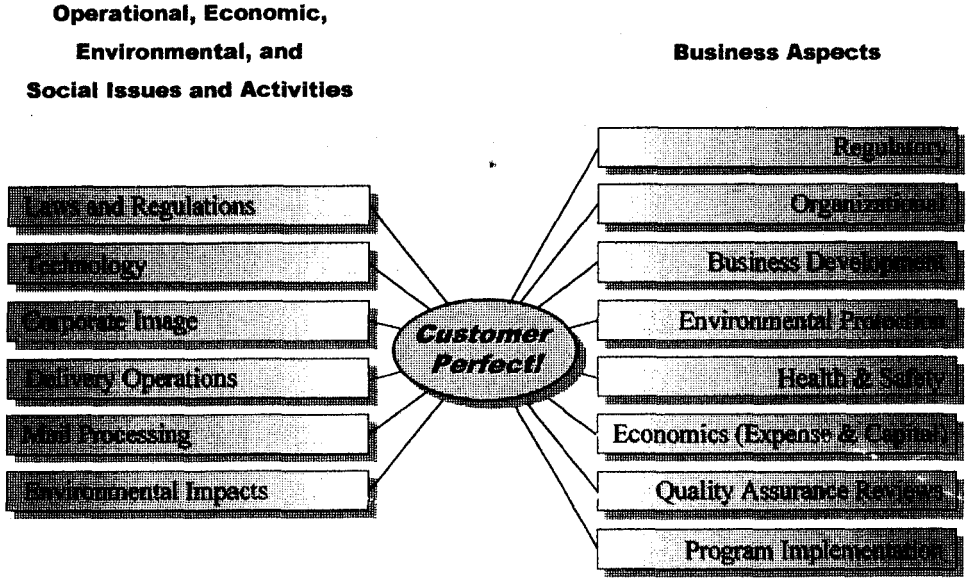
Through the three voices of *CustomerPerfect!*, the USPS has made a commitment to continually improve its business performance, of which environmental is a part. This strategic plan provides a foundation for continual improvement of environmental processes in the following ways:

- Incorporating an EMS approach toward environmental sustainability.
- Improving compliance with all applicable environmental requirements and regulations.
- Reducing operating costs with respect to waste management and the purchase of raw materials.
- Reducing the chances of creating environmental contamination that may result in environmental liabilities and cleanup.
- Increasing operating productivity by providing cleaner, healthier, and more efficient work processes through innovative environmental leadership.
- Enhancing environmental performance through communication and establishment of a reporting relationship.

"To meet the needs of the present without compromising the ability of future generations to meet their own needs."

Presidents' Council on Sustainable Development

The following diagram presents issues to consider in achieving the goal of *CustomerPerfect!*.

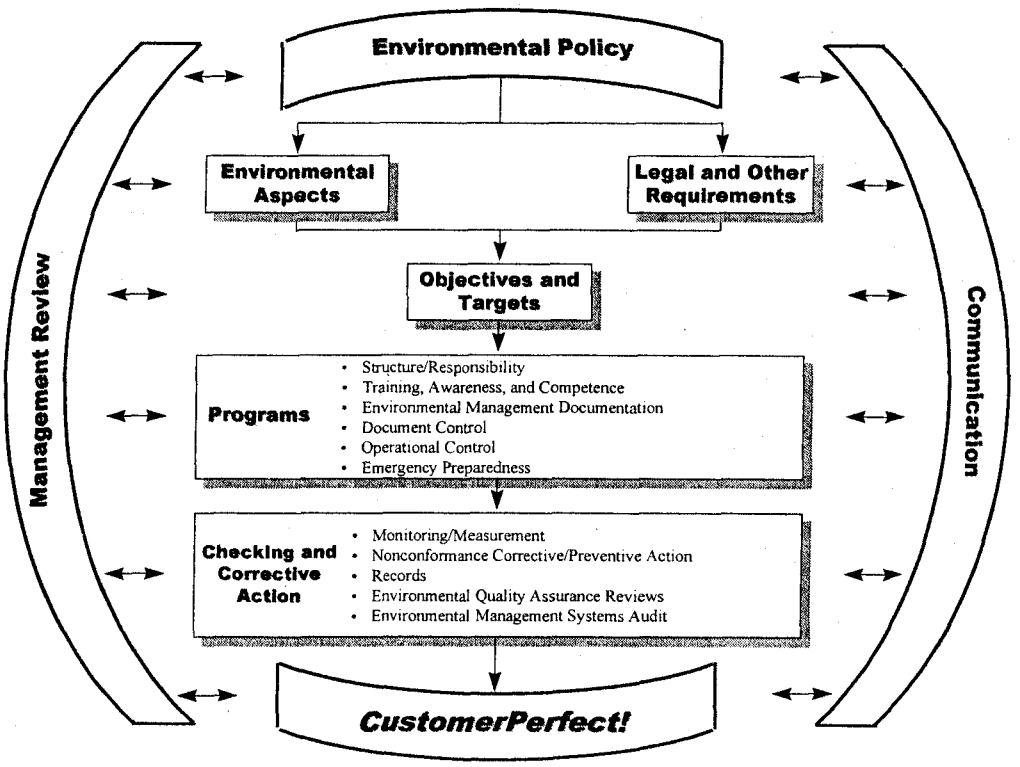


How Do We Get There?

As we face the challenge of effectively managing our environmental issues, a standardized approach using EMS elements and environmental performance evaluation (EPE) is being developed and tested. These elements set forth a method for practicing environmentally sound business management in a systematic manner. The integration of EMS and EPE will provide Capital Metro Operations with a framework to assist with our environmental policy, planning, implementation, performance, and continual improvement through the year 2000. To achieve success, Environmental Target Areas provide focus and direction for developing and implementing program plans--intermediate steps for achieving the long-term objectives at Capital Metro, district (performance cluster), and facility levels.

The diagram below illustrates Capital Metro Operations' environmental management system.

Practicing environmentally sound business management in a systematic manner.

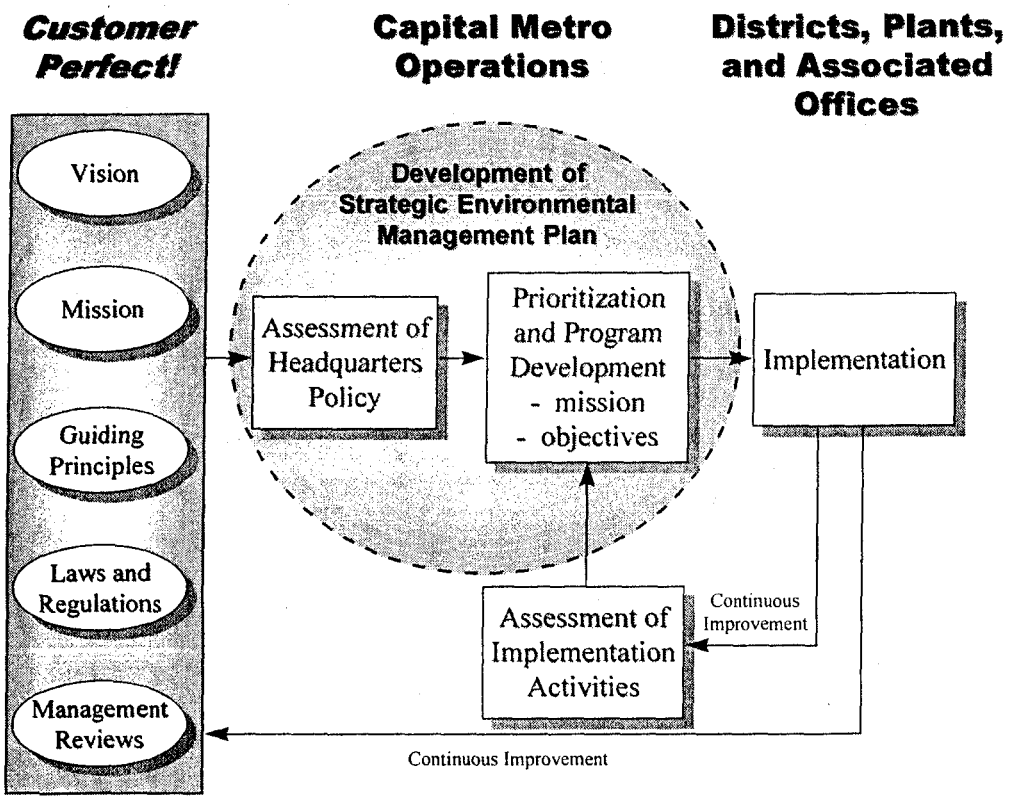


Environmental Strategic Planning Process

The strategic plan is based on *CustomerPerfect!* goals and the USPS Capital Metro Operations' Environmental Vision, Mission, and Guiding Principles; applicable laws and regulations; and management reviews for achieving environmental sustainability in a cost-effective and timely manner. Success is based on a thorough knowledge of our customer needs and technical and operational expertise.

Success is based on a thorough knowledge of our customer needs and technical and operational expertise.

The Strategic Planning Model depicted below represents the overall process of development and implementation of our Strategic Plan.



The following are the characteristics of the Strategic Environmental Management Plan:

- Living document
- Process/result oriented
- Simple.

Living Document

This plan is a "living document" that delineates programs in areas of practice that are in constant flux, due to new technologies, products, and approaches that address old and new problems. It should be reviewed periodically to address changes and ensure continual improvement.

Process/Result Oriented

As the USPS constantly improves the way we do business by making changes in our operational and delivery processes, environmental considerations should be integrated into each aspect of change. Capturing the spirit of *CustomerPerfect!*, environmental process changes are being integrated into operating systems that take full advantage of existing and new operational capabilities. Capital Metro Operations shall constantly evaluate our environmental changes and processes against specific postal standards that promote the achievement of corporate measures of successful performance. The strategic plan is revised to address those identified changes. Our plan is structured for three years to be in consonance with the strategic goals of the USPS and Environmental Management Policy.

Simple

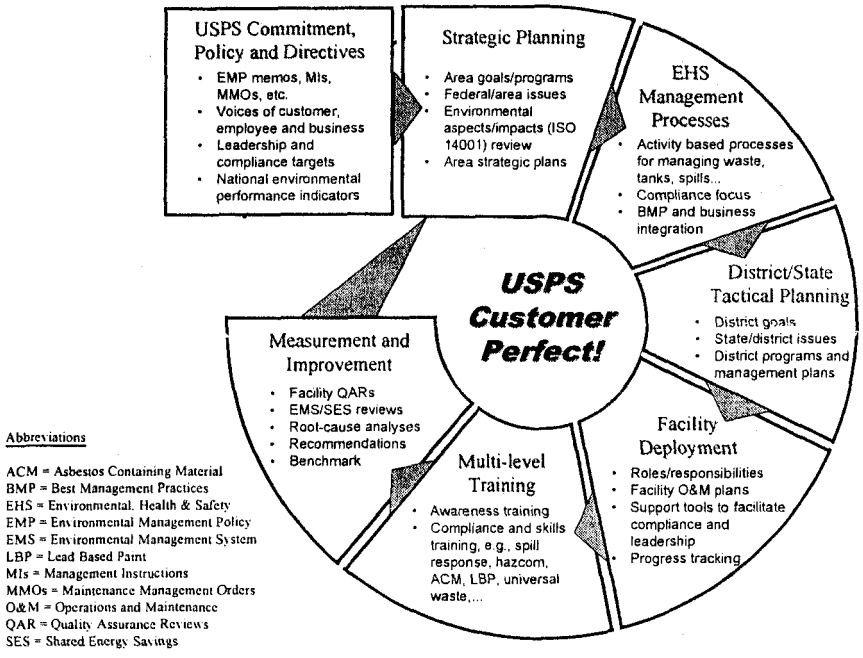
Our plan is simple. Each District Environmental Compliance Coordinator (DECC) is responsible for planning and implementing environmental activities consistent with Environmental Management Policy (EMP) guidance and direction from the Area Environmental Compliance Coordinator (AECC). Accomplishing our mission is not through increased budgets; it is by:

Evaluating processes to promote achievement of measures of successful performance.

- Creating a clear sense of our environmental mission,
- Reducing unnecessary spending,
- Developing budgets based on outcomes and requirements, and
- By measuring our success through employee satisfaction and compliance reviews.

The diagram below provides a comprehensive overview of the key elements of the EMS:

Capital Metro
Environmental Management System

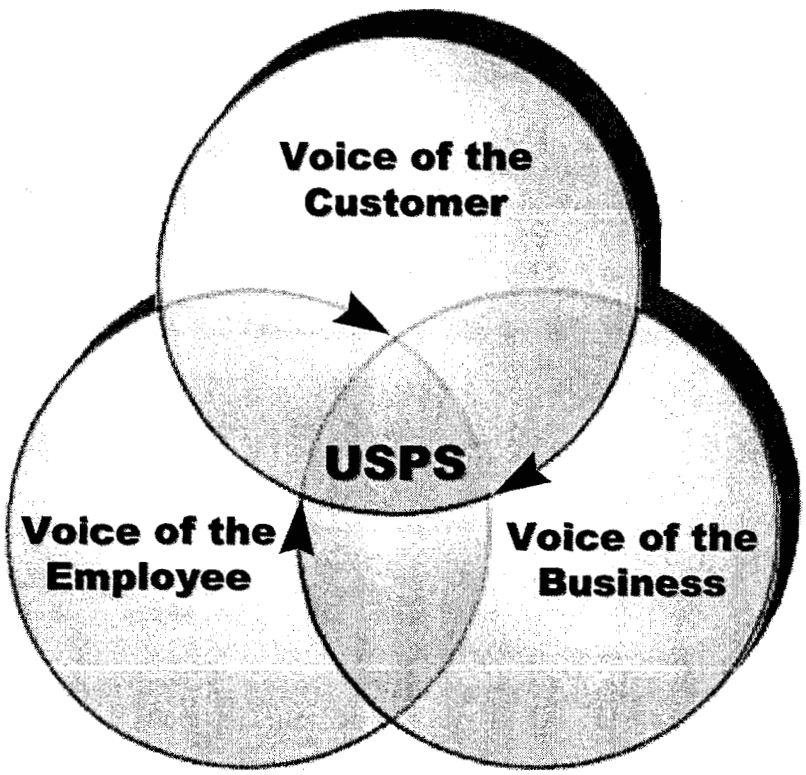


Abbreviations

ACM = Asbestos Containing Material
BMP = Best Management Practices
EHS = Environmental, Health & Safety
EMP = Environmental Management Policy
EMS = Environmental Management System
LBP = Lead Based Paint
MIs = Management Instructions
MMOs = Maintenance Management Orders
O&M = Operations and Maintenance
QAR = Quality Assurance Reviews
SES = Shared Energy Savings

Strategic Objectives and Targets

Capital Metro Operations will build on existing organizational strengths in order to minimize our impact on day-to-day operations while maximizing our environmental support. Success in achieving our *CustomerPerfect!* vision can only be measured in the eyes of the customers we support and service both in our local communities and nationally. Our objectives and targets are simple and are divided into three components that are mutually supportive of *CustomerPerfect!* We will accomplish our environmental vision by focusing on the following:



Building on existing strengths to minimize impacts on day-to-day operations while maximizing our environmental support.

Voice of the Customer	Improve customer satisfaction by developing environmental plans around operational issues to inform our customers about our work to provide a safe and healthy environment for them and the communities we service
Voice of the Employee	Strengthen employees and USPS effectiveness through increased environmental awareness and education programs.
Voice of the Business	Improve financial performance for environmental programs through best management practices and cost-avoidance.

Environmental Management

Scope

The environmental challenge facing the USPS is to comply with a myriad of requirements that differ not only from state-to-state, but many times within states. These laws, regulations, and Executive Orders require planning and coordination; specific management practices; set discharge and emission limits; detailed cleanup requirements for potential contaminated sites; protection of our postal resources; and enforcement authority. Compliance with all applicable regulations creates a formidable challenge for the U.S. Postal Service.

Meeting the environmental challenge is much more than a matter of law—it is a Voice of the Business.

Meeting the environmental challenge is much more than a matter of law—it is a Voice of the Business. Environmental management is an integral element of business for the USPS. As we focus on our guiding principles that the Postmaster General established, we also must incorporate the following objectives to meet additional environmental challenges:

- Demonstrate leadership in environmental compliance and management
- Ensure that adverse impacts on human health and the environment are avoided
- Initiate and maintain aggressive environmental programs to ensure compliance
- Protect USPS assets through comprehensive training efforts
- Integrate the pollution prevention and source reduction ethic into all USPS activities.

Action Plan

The above objectives point to the need for an effective, efficient environmental strategy. One way of establishing such a strategy is through an action plan for overall environmental compliance. This action plan provides a quick summary of the activities for achieving success. The following are the components of the action plan for environmental management:

Action Plan				
Objective	**Target**	**Strategy**	**Responsibility**	**Priority**
Improve Environmental Compliance	Exemplify CustomerPerfect!	Integrate an Environmental Management System (EMS)	AECC All USPS Employees	A

Priority Key

A = Absolute first priority: Postponement will significantly hurt our position
B = Highly desirable: Postponement will adversely affect our position
C = Desirable: If funds were to be available to enhance our position

Elements for Success

This Environmental Strategic Plan is based on a prevention process that outlines requirements and strives for 100 % standardization and conformance. The first step

toward success is a Management commitment and leadership role that emphasizes the following:

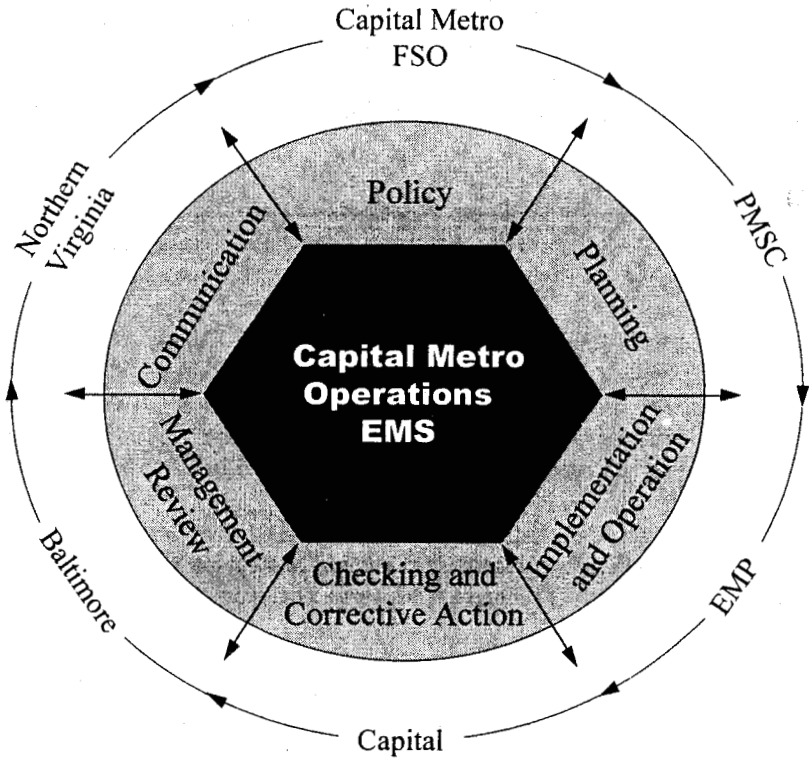
- Every level of management must be actively involved and committed to *CustomerPerfect!* goals and Environmental Management Policy (EMP).
- Each District is responsible for developing and implementing an environmental strategic plan consistent with each environmental functional area and Metro Operations guidance.
- Each District is responsible for conducting a baseline audit of each facility to determine applicable requirements, including plans, as addressed in the National Environmental Performance Indicators.
- Each District is responsible for conducting gap analyses to identify process improvements and for incorporating those improvements into the existing leadership and compliance programs and our plans to address the National Environmental Performance Indicators.

Formulation of Strategy

The formulation of strategy for this plan is targeted to maximize our strength's and eliminate our weaknesses. An EMS that aligns the efforts of the districts with our Facilities Service Office (FSO), Purchasing and Materials Service Center (PMSC), and Capital Metro Operations enhances environmental performance and creates a powerful group committed to a common vision—*CustomerPerfect!*

Enhancing environmental performance and creating a powerful group committed to a common vision—CustomerPerfect!

Strategic Interrelationships



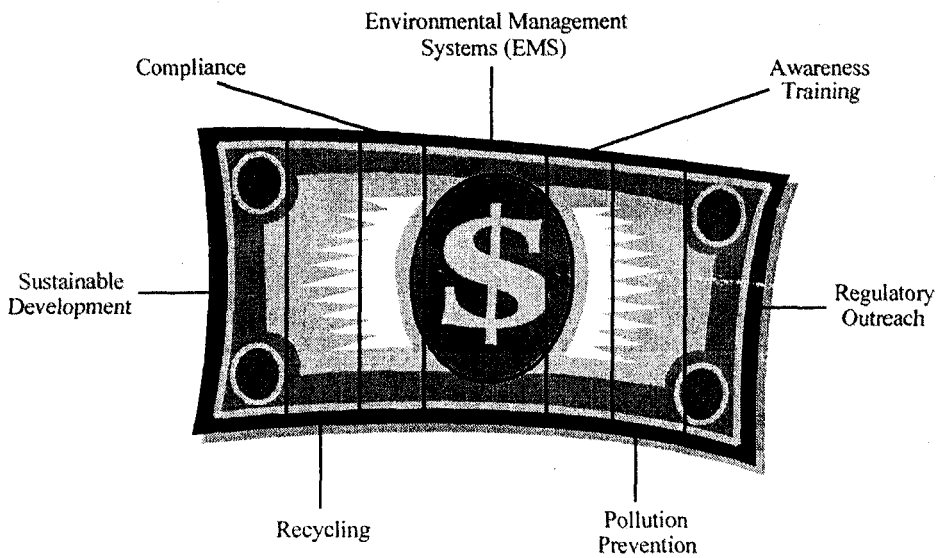
One of the most important parts of this alignment is the value of teamwork. With Capital Metro Operations as our foundation, the value from our customers, suppliers, and our employees is unsurpassed.

Environmental Funding

Meeting our commitment to environmental management requires careful financial planning and revenue management. Within the USPS, most environmental costs can be divided into two categories: Expense and Capital, which could be defined as Direct and Indirect costs. For example, an asbestos survey can be accomplished using environmental expense funds and is clearly related to an evaluation of a specific program. However, asbestos abatement is not authorized using environmental expense funds and is considered an indirect cost. Indirect costs, which are not easily identifiable, and at times costly, but which is nonetheless, necessary to the operation of the program. These indirect costs must be evaluated and shared among each phase of an operation, function or facility. Other indirect costs, or shared costs may include hazardous waste disposal, abatement projects, safety training, or capital purchases not directly related to environmental management.

Beginning with Fiscal Year 1998, each district will be given $100,000 independently to fund and execute environmental management programs within each district performance cluster. Additional requests for funding beyond the initial $100,000 allocation will trigger the formation of the Capital Metro Operations Environmental Evaluation Team (CMOEET). A Justification of Expense (JOE) or Decision Analysis Report (DAR) will accompany each request for additional funding. The members of the CMOEET, which will include the Finance Managers and Environmental Compliance Coordinators for each District, will review and approve each additional request for funding.

The primary funding needs targeted for Capital Metro Operations will focus on EMS, Pollution Prevention, Environmental Quality Assurance Reviews (EQARs), Tank Management, Regulatory Outreach, Education and Awareness Training, and Sustainable Development.



Funding and executing a sound environmental management systems approach toward compliance.

Capital and Expense Commitment

Capital Metro Operations must limit its capital commitments, particularly postal support equipment, and depreciation expenditures to the essentials. There are various requirements that govern the requisition of goods and services and the expenditure of funds related to capital projects and environmentally related expenses.

For planning purposes, it is requested that environmental funds allocated during each Fiscal Year (FY) be processed for any major capital and/or expense requisitions initially by AP 4 to protect funds requested. All other environmental funding requisitions should be processed by AP 12, except for work currently under way on advanced requirements. Other exceptions may be granted at the discretion of the buying manager or Purchasing Materials and Service Center (PMSC).

The processing of environmental funding requests to include any solicitations or negotiations with vendors should be completed by AP 12, to prevent delayed processing of requirements and funds being charged against the next fiscal year.

Each source, even though different, will collectively fund and execute a sound environmental management systems approach toward compliance. This systematic approach shall provide a foundation for efficient use of resources across Capital Metro Operations.

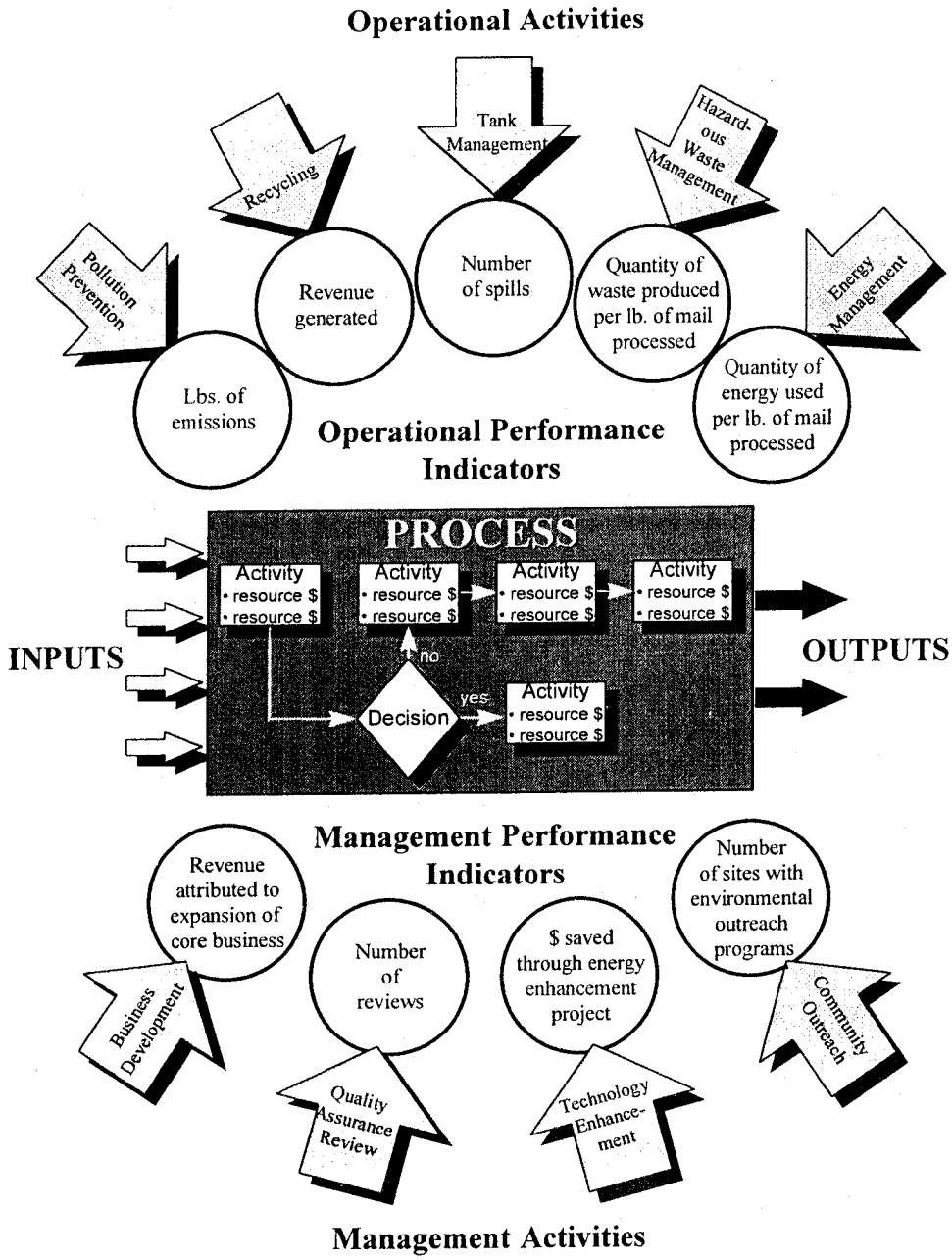
Environmental Activity-Based Costing (ABC)

At the facility level, USPS managers need both technical and financial information to evaluate the feasibility of any type of capital investment project before making decisions on implementation. Current accounting systems, however, may collect environmental cost information by aggregating environmental expenditures into general cost categories. Environmental costs are then assigned to "cost centers" (e.g., a department, a building, a machine shop, etc.) by use of allocation methods. Using this method, environmental costs may not be accurately assigned to the products, processes, or services actually generating these costs.

Current cost accounting systems used in most organizations assign costs to products and processes by either direct tracing or allocation. An example of direct tracing is assigning the cost of raw materials to the product or process using the material. This is the most precise method of cost assignment, but this kind of direct link of costs to products, processes, and services is not always apparent. Allocation, which is the least precise method of cost assignment, entails assigning overhead costs, such as hazardous waste disposal, to products or processes on the basis of such factors as direct labor hours or production volumes, regardless of what factors actually drive the costs. This often reduces the relevance and precision of the ultimate process or product cost.

Such an activity-based approach allows the user to assign costs in a way that is more precise than allocation, yet more practical than direct tracing. The idea is to define *cause-and-effect relationships* between resources and the activities, or processes that consume those resources. This is accomplished by first assigning

resource costs to activities and then assigning the activity costs to the processes through the use of *drivers*, as shown in the diagram on the following page.



Enhancing Capital Metro Operations' ability to manage environmental costs effectively.

To enhance its ability to manage environmental costs effectively, Capital Metro Operations needs to identify relevant environmental costs associated with key business processes. By applying activity-based cost accounting, the USPS can define indicators for associating the environmental costs and performance and the financial performance. The initial focus will be on the impact of environmental programs on Line 42.

Management Reports

Management reports are required to ensure consistency in the application of an EMS within Capital Metro Operations and to acknowledge specific accomplishments of environmental programs or initiatives. There shall be three types of reports: Monthly, Mid-Year, and Annual Reports. These reports shall be coordinated and completed by each District Environmental Compliance Coordinator and submitted no later than the third of each month, or other established time periods.

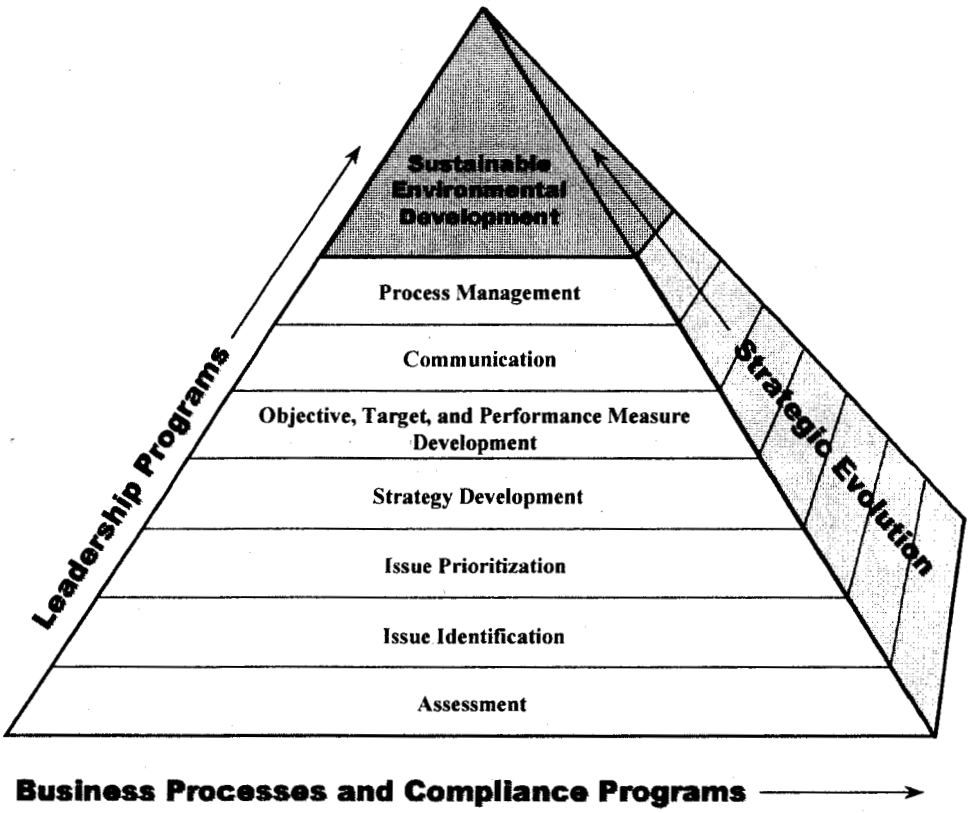
Monthly Reports overall district performance for the month and compares actual accomplishments to the plan. Includes income and expense justification, including a comparison of budgeted to actual expenditures. Also includes an overall summary of program highlights, accomplishments, and concerns. These reports are compiled and used to develop the annual report.

Achieving sustainable development to meet the needs of the present without compromising the ability of our future.

Mid-Year Highlights accomplishment within a six month timeframe, to include accomplishments not contained within the monthly reports. The mid-year report will be forwarded to EMP by the AECC to summarize Metro Operations accomplishments for publication.

Annual Each district compiles an annual report and submits it to the AECC. The AECC then develops a Metro-wide annual report and submits it to EMP. EMP then uses the information to develop the *Annual Board of Governors Report.*

This Strategic Environmental Management Plan sets forth Capital Metro Operations' goals for achieving sustainable development to meet the needs of the present without compromising the ability of our future. As shown in the diagram below, it addresses environmental management elements that create a strong foundation for the development of programs and achievement of sustainable environmental development.



To target environmental sustainability, we must strategically evaluate processes that integrate our employees, customers, and suppliers when considering materials, methods, or equipment that may have an environmental impact within each process.

Programs

This portion of this strategic management plan addresses the following programs:

- Underground Storage Tank Program
- Clean Air Act Amendments
- Hazardous Chemicals
- Paint Spray Operations
- Mail Transport Equipment
- Recycling/Pollution Prevention
- Regulatory Outreach
- Sensitivity to State and Local Regulators
- Awareness Training
- Quality Assurance Reviews
- Energy and Water Conservation

Each section will include the following information:

- Scope
- Objectives and Targets
- Accountability and Responsibility
- Insights and Reminders

The programs listed on the previous page are divided into two categories—leadership and compliance, as listed below:

Leadership Programs

- Underground Storage Tanks
- Clean Air Act Amendments
- Hazardous Chemicals
- Paint Spray Operations
- Mail Transport Equipment
- Recycling & Pollution Prevention

Compliance Programs

- Regulatory Outreach
- Sensitivity to State & Local Regulators
- Awareness Training
- Quality Assurance Reviews
- Energy & Water Conservation

Underground Storage Tank Program

Scope

Underground storage tanks are significant polluters of ground water systems, if not properly managed.

Throughout the United States underground storage tanks (USTs) have been singled out as significant polluters of ground water systems. To alleviate this environmental problem, EPA promulgated regulations to upgrade all tanks or have them removed by 1998 in order to reduce or eliminate potential ground water pollution sources. The upgrade requirements relate to spill, overfill, and corrosion protection.

There are approximately 750 Postal Facilities within Capital Metro Operations. The exact number of USTs is unknown at this time. Inventories are underway in each district to determine the number of tanks and other information pertinent to remaining or attaining compliance with regulatory requirements. Aboveground tanks will also be surveyed for statistical purposes. These actions will be completed prior to Fiscal Year 1997 so appropriate actions can be taken to ensure compliance with all regulatory guidance by 1998. Depending on individual tank status, the tanks will either be upgraded to meet all requirements or be removed. If they are removed, alternate sources of fuels will be substituted or purchased from non-Postal sources.

Capital Metro Operations encompasses three separate governmental units: The District of Columbia, Maryland, and Northern Virginia. Due to this, it is important to consider the regulatory requirements specific to these governmental units before instituting any program at the Capital Metro Operations level. Federal and USPS guidance must also be considered prior to any action.

Objectives and Targets

The following are the objectives of the Underground Storage Tank Program:

- Meet December 1998 UST deadline
- Reduce the number of nonessential tanks
- Complete surveys and implement a management plan
- Establish monitoring and requisite tightness testing required by law
- Upgrade, test, license or pull tanks, prior to the 1998 deadline
- Implement best management practices for all regulated and non-regulated tanks.

To accomplish the objectives associated with the program, it is necessary to develop targets, develop a strategy, identify responsibility, and determine the priority of the program. The following table shows the action plan associated with accomplishing the objectives of this program.

Action Plan				
Objective	**Target**	**Strategy**	**Responsibility**	**Priority**
Meet 1998 UST deadline	25% reduction in tanks by 2000	Complete by 12/98	DECC	A

Priority Key

A = Absolute first priority: Postponement will significantly hurt our position
B = Highly desirable: Postponement will adversely affect our position
C = Desirable: If funds were to be available to enhance our position

Accountability and Responsibility

Specific roles and responsibilities associated with the UST Program are highlighted in the following table.

Roles and Responsibilities of Environmental Coordinators

AECC	DECC	FEC
• Oversee UST management and coordinate compliance audits	• Coordinate program development and implementation with AECC • Coordinate budget with AECC	• Identify site storage tank characteristics
• Promote new technologies to the Districts.	• Identify and provide oversight of UST management and training requirements	• Provide site storage tank characteristics to DECC
• Ensure that cathodic protection and tank tightness testing are performed	• Coordinate UST activities with AECC, Administrative Services, Operations Support, FECs, and fleet managers	• Maintain required operating permit conditions and secure permit renewals
• Develop, assist, and implement operation & maintenance, and management plans. • Maintain UST database	• Coordinate tank system integrity testing with AECC • Work with Administrative Services and FSO on UST related activities	• Monitor tank management practice • Ensure long-term facility compliance
• Coordinate UST training requirements metro-wide	• Assist facility managers obtain required renewals, implement plans, prepare notifications	• Maintain operating records
• Report to federal and state agencies as required	• Evaluate UST programs • Prioritize work plans • Provide UST project status Reports	• Maintain "as built" drawings showing complete UST system, to include piping

Insights and Reminders

- Implement best management practices for all regulated and non-regulated tanks.
- Ensure all UST installations and/or upgrades meet applicable standards by 1998.
- Monitor compliance for UST and AST requirements.
- Develop and implement a UST Management Plan.
- Coordinate with administrative services for planned facility improvements.

Clean Air Act Amendments

Scope

The Clean Air Act requires that releases of potential hazardous air pollutants be eliminated or controlled.

The Clean Air Act requires that the release of potential hazardous air pollutants be eliminated or controlled. In the early 1970s the Clean Air Act was enacted to reduce the amount of pollutants entering the atmosphere. There have been numerous federal as well as local government modifications since its inception. This has been especially true in those "nonattainment" areas of the country where pollutant limits are being exceeded.

A significant portion of Capital Metro Operations lays within a nonattainment air quality zone, as defined by the USEPA, and therefore must meet more stringent air pollution prevention requirements. Often this is due to atmospheric conditions, geographic conditions, or simply large population concentrations. The USPS is studying hazardous chemical use, paint spray vapors, and vehicle emissions to facilitate control of air emissions.

Paint spray operations at VMFs are being surveyed for compliance, upgrade, or closure.

Vehicle emissions are a significant source of air pollution. This is especially critical in non-attainment areas. Because of this, the USPS is taking steps to develop non-polluting energy sources for all vehicles. Currently USPS facilities and vehicles in Capital Metro Operations are considered a minor emissions source and are not required to report under Title V of the Clean Air Act. Capital Metro Operations has approximately 8500 vehicles. If regulations become more stringent, Capital Metro Operations may convert its vehicles for use of compressed natural gas (CNG) and other alternative forms of fuel. Approximately 270 vehicles have at this time been converted to CNG capabilities, although not all are actually using CNG due to the lack of fueling facilities. There are no solar powered vehicles in the inventory at this time. The environmental management programs will assist, whenever possible, with the conversion Postal vehicles to alternate non-polluting fuels.

Objectives and Targets

The following are the objectives of the Clean Air Act Program:

- Control release of air pollutants to protect health and the environment
- Eliminate and reduce emission sources from Stationary, Mobile, and Indirect sources
- Develop plans to use alternate fuels
- Enhance awareness for CNG usage
- Incorporate Best Management Practices (BMPs) for air pollution prevention
- Support all efforts to convert gasoline driven engines to alternate fuels.

To accomplish the objectives associated with the program, it is necessary to develop targets and a strategy, identify responsibility, and determine the priority of the program.

The following table shows the action plan associated with accomplishing the objectives of this program.

Action Plan				
Objective	**Target**	**Strategy**	**Responsibility**	**Priority**
Eliminate spray paint bootns or install BMP systems by 2000	25% reduction in Class 1 CFC use by 2005 over 1997	Complete surveys 3/98	DECC	B

Priority Key

A = Absolute first priority: Postponement will significantly hurt our position
B = Highly desirable: Postponement will adversely affect our position
C = Desirable: If funds were to be available to enhance our position

Accountability and Responsibility

Specific roles and responsibilities of those associated with addressing the requirements of the Clean Air Act are highlighted in the following table.

Roles and Responsibilities of Environmental Coordinators

AECC	DECC	FEC
• Serve as environmental focal point for Title V compliance and coordinate compliance audits.	• Coordinate program development and implementation with AECC • Conduct air emissions inventories when needed to determine a facility's Title V source and/or permit status	• Coordinate with DECC to determine which facilities require Title V operating permits, synthetic minor, minor status or exemptions
• Provide guidance, oversight, and awareness for Capital Metro	• Verify major source status when facility design or operations is altered to adversely affect the potential to emit	• Prepare and submit Title V operating permit applications, renewals, exemption request, etc.
• Coordinate with DECCs to resolve Title V issues	• Monitor District Title V compliance activities, including agency inspections	• Comply with Title V permit requirements
• Work with DECCs and facility manages to identify and implement air emission pollution prevention methodologies enabling facilities to remain at or below 50% threshold levels for major Sources	• Work with AECC and facility managers to identify and implement air emissions pollution prevention methodologies	• Work with DECC and facility personnel to identify and implement air emission pollution prevention methodologies, and conduct air emission inventories
• Coordinate with DECCs and SLAQM offices to identify Title V area facilities, and which ones may qualify for synthetic minor, or exempt status	• Assist facility managers prepare Title V permit applications, renewals, exemption request, and other required documents	• Comply with recordkeeping requirements as outlined in the MI
• Ensure that area facility managers prepare and submit Title V permit applications in a timely manner (where regulatory threshold has been exceeded)	• Ensure that all plants and VMFs are covered by the SLAQMs limiting potential to emit and/or synthetic minor rules	• Provide major source emission documentation, if requested by regulatory agency
• Maintain liaison with federal, state, and local environmental regulatory agencies	• Coordinate the AECC and SLAQM offices to identify Title V area facilities • Confirm facility compliance with recordkeeping requirements • Work with AECC to maintain liaison with federal, state and local environmental agencies	• Provide major source emission documentation, if requested by DECC at least semi-annually

Insights and Reminders

- Complete Paint Spray operations at VMFs by 1998
- Monitor Title V Compliance activities with agency inspectors
- Ensure that all plants and VMFs are covered by the SLAQMS

Hazardous Chemicals

Scope

The USPS is implementing two programs to assist in reducing or eliminating the use of hazardous chemicals. These include the following:

- **Recycling/Pollution Prevention**. One of the activities associated with this program is the reduction of the 17 hazardous chemicals listed by EPA's Industrial Toxics Project. This is being accomplished by controlling the purchase and use of those chemicals or by substituting nonhazardous chemicals. Coordination with chemical suppliers and the purchasing specialist within each District is encouraged to identify ways to support this initiative. This program will save money as well as reduce the number of chemicals that could enter the environment as hazardous waste. The inception of recycling/pollution prevention plans places additional emphasis on the reduction of hazardous wastes and creates a need for closer working relationships with the applicable regulatory agencies.
- **Development of educational programs**. Training specialists have been contracted, in conjunction with Safety, to present hazardous materials awareness classes.

Recycling/Pollution Prevention and Educational programs will assist in reducing or eliminating the use of hazardous chemicals.

Objectives and Targets

The following are the objectives of the Hazardous Chemicals Program:

- Identify hazardous chemicals
- Reduce the number of hazardous chemicals used and/or purchased
- Complete an annual inventory and determine potential for substituting safe alternatives
- Reduce generator status to conditionally exempt, wherever possible.

To accomplish the objectives associated with the program, it is necessary to develop targets and a strategy, identify responsibility, and determine the priority of the program. The following table shows the action plan associated with accomplishing the objectives of this program.

Action Plan				
Objective	**Target**	**Strategy**	**Responsibility**	**Priority**
Reduction of 17 targeted chemicals by 90%	Reduction in waste cost by 12/97	Complete surveys 3/98	DECC	A

Priority Key

A = Absolute first priority: Postponement will significantly hurt our position
B = Highly desirable: Postponement will adversely affect our position
C = Desirable: If funds were to be available to enhance our position

Accountability and Responsibility

Specific roles and responsibilities associated with the Hazardous Chemical Program are highlighted in the following table.

Roles and Responsibilities of Environmental Coordinators

AECC	DECC	FEC
• Responsible for program implementation, development, tracking, monitoring, and reporting • Assess with compliance with regulations, and recommend solutions to problems, if necessary	• Coordinate program development and implementation with AECC • Ensure implementation of environmentally sound hazardous waste practices • Develop recordkeeping system for hazardous waste management and minimization • Submit required reports to regional and state coordinators	• Assist with establishing Best Management Practices for Hazardous Waste Management • Survey operations and processes within the facility to determine where chemicals are used - identify where waste can be minimized
• Identify release reporting requirement within Capital Metro	• Advise facility installation heads and responsible officials concerning hazard identification, release notification and spill response procedures • Act as the focal point for all releases and spills to develop and implement emergency response plans	• Assess initial actions with regard to minor releases and spills
• Ensure that all releases and spills are reported to appropriate officials consistent with federal and state release reporting requirements	• Ensure that all releases and spills are documented and forwarded to appropriate officials consistent with federal and state release reporting requirements	• Forward any information on all releases and spills to the DECC for appropriate action to comply with federal and state release reporting requirements

Insights and Reminders

- Conduct Quality Assurance Reviews (QARs) at all P&DCs and other high risk facilities by the end of calendar year 1997.
- Develop a program that will screen all potentially hazardous chemicals and complete Pollution Prevention plans by March 1998 to determine benchmark status.
- Develop, in conjunction with Safety, an ongoing training program for all personnel involved in the ordering and or use of hazardous chemicals.

Paint Spray Operations

Scope

The Clean Air Act, Title V and amendments, define the release and control of VOCs into the atmosphere. The USPS operates approximately six paint spray booths at VMFs in the Metro District. Paint spray operations have frequently been found to be a significant contributor to air pollution, due to improper or ineffective control measures.

The USPS, in its effort to be a good environmental steward, is upgrading or closing all paint spray operations. Surveys are being scheduled to determine the compliance status of each booth. In cases where booths are not being fully utilized or are so antiquated they cannot be brought into compliance cost effectively, they should be removed. In situations where the paint spray operations will be upgraded, new equipment should be evaluated prior to acquisition to identify potential air pollution releases to identify ways to replace EPA-listed ozone depleting substances with safe substitutes or alternative processes to the maximum extent possible. Additional evaluation should be conducted to ensure that all actions align with process requirements and are economically feasible. After equipment upgrade, employees engaged in painting operations should be trained in the best spray paint methods.

USPS is upgrading or closing all paint spray operations.

Objectives and Targets

The following are the objectives of the Paint Spray Operations Program:

- Reduce or eliminate paint spray operations, wherever possible
- Convert required operations to efficient technologies
- Minimize liability and reduce cost through best management practices.

To accomplish the objectives associated with the program, it is necessary to develop targets and a strategy, identify responsibility, and determine the priority of the program. The following table shows the action plan associated with accomplishing the objectives of this program.

Action Plan				
Objective	**Target**	**Strategy**	**Responsibility**	**Priority**
Eliminate spray paint booths or install BMP systems by 2000	25% reduction in Class 1 CFC use by 2005 over 1997	Complete surveys 12/97	DECC	B

Priority Key

A = Absolute first priority: Postponement will significantly hurt our position
B = Highly desirable: Postponement will adversely affect our position
C = Desirable: If funds were to be available to enhance our position

Accountability and Responsibility

Specific roles and responsibilities associated with the Paint Spray Operations Program are highlighted in the following table.

Roles and Responsibilities of Environmental Coordinators

AECC	DECC	FEC
• Communicate to Capital Metro the latest technology	• Coordinate program development and implementation with AECC • Conduct annual inventory of all existing paint spray operations	• Assist with the inventory of all existing paint spray operations
• Serve as the focal point for air issues	• Identify and provide oversight of air emission surveys	• Develop source reduction and Standard Operating Procedures for paint spray operations

Insights and Reminders

- Evaluate each booth for compliance by the end of calendar year 1997.
- Secure all booths that are not being fully utilized or cannot reasonably be brought into compliance with current environmental regulations.
- Develop, in conjunction with Safety, an ongoing training program for all personnel involved in paint spray operations.
- Take all applicable steps to assure state-of-the-art equipment is being used in each facility to prevent or reduce potential air pollution through the use of high-volume low-pressure (HVLP) spray equipment.

Mail Transport Equipment

Scope

The normal process of handling and transporting mail results in the need to dispose of mail handling/transport equipment (MTE) such as hampers, pallets, and bags. In the past, disposal has resulted in adding to the overburdened landfills. The USPS is aggressively seeking ways to recycle MTE. The availability of a manufacturer of recyclable equipment is a concern. It is hoped that this market will expand. The USPS may or may not be able to create markets for items made of recycled materials. Management and employees need to be educated and informed about the need to procure recyclable equipment and markets need to be developed within USPS for reutilization of recycled materials.

USPS is aggressively seeking ways to recycle mail handling/ transport equipment.

The vehicles used to transport mail present other environmental concerns. Environmental programs are being developed to promote the conversion of USPS vehicles to alternate, non-polluting fuels. One such program is Capital Metro Operations' work with USPS Headquarters, EMP to promote the use of CNG vehicles in the District.

Objectives and Targets

The following are the objectives of the MTE Program:

- Reduce waste streams and increase life cycle of materials
- Establish recycling programs of MTE items
- Partner with other sources to minimize use of resources
- Maintain liaison with State regulatory agencies regarding air pollution control
- Promote the use of recyclable mail handling/transport equipment.

To accomplish the objectives associated with the program, it is necessary to develop targets and a strategy, identify responsibility, and determine the priority of the program. The following table shows the action plan associated with accomplishing the objectives of this program.

Action Plan				
Objective	**Target**	**Strategy**	**Responsibility**	**Priority**
Reduction of MTE waste streams	Enhance program recycling opportunities	Complete surveys 12/98	DECC	C

Priority Key

A = Absolute first priority: Postponement will significantly hurt our position
B = Highly desirable: Postponement will adversely affect our position
C = Desirable: If funds were to be available to enhance our position

Accountability and Responsibility

Specific roles and responsibilities associated with the MTE Program are highlighted in the following table.

Roles and Responsibilities of Environmental Coordinators

AECC	DECC	FEC
• Provide technical, marketing, and managerial expertise	• Coordinate program development and implementation with AECC • Assist facility managers develop programs to enhance source reduction, waste separation, and recycling	• Ensure compliance
• Research and develop methods to train employees to request recyclable materials	• Promote to management and employees procurement of recyclable MTE and other methods of making MTE more environmentally friendly	
	• Work with AECC to promote use of CNG vehicles in Capital Metro Operations	
• Identify or create markets for recyclable materials within the USPS		
• Oversee MTE management reduction procedures	• Ensure a recycling coordinator has been designated	• Encourage employee participation

Insights and Reminders

- Develop recycling programs for MTE items.
- Develop methods to train employees to request recyclable materials.
- Create markets for recyclable materials within USPS.

Recycling/Pollution Prevention

Scope

Numerous waste streams emanate from USPS facilities, especially the P&DCs and VMFs. In accordance NEPA and Postal guidance, as found in AS-552 and 523, the USPS is making every attempt to reduce the number of waste streams and the amount of waste materials leaving USPS facilities. To do this, recycling of certain materials and the reduction of others is being addressed through the recycling/pollution prevention program.

USPS is making every attempt to reduce the number of waste streams and the amount of waste materials leaving USPS facilities.

There are several activities currently part of the pollution prevention program:

- Use of 17 EPA-listed target chemicals is being reduced or eliminated. These chemicals are being replaced with nonhazardous substitutes.
- Draft storm water pollution prevention plans have been developed for the VMFs.
- Spill prevention programs and kits are available at each facility.
- Recycling of Undeliverable Standard Mail (USM) is underway and will expand to office paper and lobby mail.
- Waste metals are being purchased and processed by scrap metal companies.
- Aluminum cans are being collected at many locations for transport to recyclers.
- Waste oil and antifreeze are being collected and reprocessed.

For the activities above to be beneficial to the USPS, they must enhance revenues, and losses must not occur. The cyclical nature of the recycled paper market makes revenue predictions for that activity very difficult. Efforts must be coordinated to ensure that savings are maximized at each opportunity. Ensuring "buy-in" by employees at all levels is very important if the program is to reach maximum effectiveness.

Objectives and Targets

The following are the objectives of the Recycling/Pollution Prevention Program:

- Identify hazardous chemicals
- Reduce the number of hazardous chemicals used and/or purchased
- Complete an inventory and determine potential for substituting safe alternatives
- Reduce generator status to conditionally exempt, wherever possible
- All USM recycled by the end of calendar year 1997
- All office paper recycled by March 1998
- All waste streams identified and reduced as appropriate by December 1997
- Beneficial waste hauling contracts in place by the end of calendar year 1998.

To accomplish the objectives associated with the program, it is necessary to develop targets and a strategy, identify responsibility, and determine the priority of the program. The following table shows the action plan associated with accomplishing the objectives of this program.

Action Plan					
Program Component	**Objective**	**Target**	**Strategy**	**Responsibility**	**Priority**
Recycling	60% participation in recycling by 1997	50% reduction in solid waste disposal cost by 2000 over 1997	Complete surveys annually	DECC	A
Pollution Prevention	Achieve conditionally exempt status for USPS facilities by 12/98	Pollution Prevention: Reduce 17 targeted chemicals by 90% by 12/98	Complete surveys annually	DECC	A

Priority Key

A = Absolute first priority: Postponement will significantly hurt our position
B = Highly desirable: Postponement will adversely affect our position
C = Desirable: If funds were to be available to enhance our position

Accountability and Responsibility

Specific roles and responsibilities associated with the Recycling/Pollution Prevention Program are highlighted in the following table.

Roles and Responsibilities of Environmental Coordinators

AECC	DECC	FEC
• Assist DECC to establish sustainable pollution prevention program	• Coordinate program development and implementation with AECC • Conduct Quality Assurance Reviews to define the use of resources for pollution control and recycling purposes • Develop an overall Pollution Prevention Plan by March 1998.	• Pollution Prevention plans and Storm Water Pollution Prevention plans are being developed • Wood pallet removal/ recycling companies are being contacted to reduce or eliminate the cost of pallet disposal

Insights and Reminders

- Develop an overall Pollution Prevention Plan by March 1998.
- Complete inventory and determine potential for substantial safe alternatives for hazardous chemicals.

Regulatory Outreach

Scope

Historically Capital Metro Operations' environmental programs have been reactive in nature rather than proactive. With the addition of District Environmental Coordinators, a more proactive stance has been taken. These resources will permit a greater presence at local and state policy setting meetings, which will help promote the USPS as a leader in the environmental arena and promote an attitude of stewardship that will benefit both the USPS and the environment.

Capital Metro Operations is taking a more proactive stance.

The DECCs are members of or have attended meetings at the EPA Environmental Roundtable, National Environmental Taskforce '96, Chesapeake Bay Program, national and state recycling coalitions, and environmental regulatory agencies within their respective states. Each of these entities is influential in setting policy in their respective fields.

Objectives and Targets

The following are the objectives of the Regulatory Outreach Program:

- To hold periodic meetings with appropriate regulators.
- To attend outside meetings and conferences that address environmental issues.
- To assume positions on local environmental committees, both locally and nationally, that will promote USPS environmental stewardship.
- To share environmental information and ideas with other environmental groups.

To accomplish the objectives associated with the program, it is necessary to develop targets and a strategy, identify responsibility, and determine the priority of the program. The following table shows the action plan associated with accomplishing the objectives of this program.

Action Plan				
Objective	**Target**	**Strategy**	**Responsibility**	**Priority**
Promote environmental sustainability	Enhance stewardship and partnership opportunities	Foster community-driven strategic planning	DECC	C

Priority Key

A = Absolute first priority: Postponement will significantly hurt our position
B = Highly desirable: Postponement will adversely affect our position
C = Desirable: If funds were to be available to enhance our position

Accountability and Responsibility

Specific roles and responsibilities associated with the Regulatory Outreach Program are highlighted in the following table.

Roles and Responsibilities of Environmental Coordinators

AECC	DECC	FEC
• The development of a Postmaster's Guidebook will help further expand the reach of environmental programs through Postmasters and into the local communities • Coordinate Metro-wide outreach programs for each district	• Coordinate program development and implementation with AECC • Gain a more influential position with local, state, and federal policy setting groups as part of a "good neighbor" concept • Participate in local regulatory development and environmental associations • Coordinate with AECC on any outreach initiatives that impact more than one district	• Assist DECC with site-specific initiatives

Insights and Reminders

- Hold periodic meetings with appropriate regulators.
- Participate on local environmental committees to promote USPS environmental stewardship.

Sensitivity to State and Local Regulators

Scope

For the USPS to become a leader in the environmental arena, it is necessary to become more aware of local governing agencies and action groups and to work to develop a liaison and rapport with these groups that will help promote USPS environmental programs.

USPS is working to develop a liaison and rapport with groups that will help promote USPS environmental programs.

Prior to the DECCs being hired in the Capital District, there was little or no emphasis in working with local environmental groups. Such activities are now emphasized in order to establish goodwill with surrounding local governmental agencies and citizen groups.

Objectives and Targets

The following are the objectives of the Sensitivity to State and Local Regulators Program:

- Seek out environmental opportunities at the state and local level
- Promote environmental activities such as Earth Day
- Promote new environmental stamp releases

To accomplish the objectives associated with the program, it is necessary to develop targets and a strategy, identify responsibility, and determine the priority of the program. The following table shows the action plan associated with accomplishing the objectives of this program.

Action Plan				
Objective	**Target**	**Strategy**	**Responsibility**	**Priority**
Measure progress through national environmental goals	Improve access to information with AECC	Continue and intensify environmental efforts	AECC/DECC	C

Priority Key

A = Absolute first priority: Postponement will significantly hurt our position
B = Highly desirable: Postponement will adversely affect our position
C = Desirable: If funds were to be available to enhance our position

Accountability and Responsibility

Specific roles and responsibilities associated with the Sensitivity to State and Local Regulators Program are highlighted in the following table.

Roles and Responsibilities of Environmental Coordinators

AECC	DECC	FEC
• Develop guidelines for government interactions • Encourage employees at all levels to participate in environmental associations and governmental activities	• Coordinate program development and implementation with AECC	• Coordinate with DECC
• Participate in international, national organizations and federal taskforces	• Participate in national, state, and regional organizations and federal, state, regional taskforces	• Participate in state, local, and regional organizations and state, local regional taskforces

Insights and Reminders

- Develop a liaison with Federal, state, and local governing agencies and citizen groups.
- Promote environmental activities at state and local levels.

Awareness Training

Scope

Federal regulatory guidance requires that all persons affected by environmental actions be fully informed of those actions and the possible consequences through such programs as: EPCRA, HAZWOPER, and HAZCOM.

Federal regulatory guidance requires that all persons affected by environmental actions be fully informed of those actions and the possible consequences.

Previously, information regarding hazards in the workplace or hazardous practices affecting the environment had not been fully disseminated to the workforce. However, progress has been made through the hazard communications programs conducted for employees who may be exposed to hazardous chemicals. Newcomer training programs, pamphlets, brochures, and news articles are being developed for dissemination.

Because environmental responsibilities are part of the individual performance assessment reviews for EAS levels 18 and above, more training opportunities should be afforded to management.

Objectives and Targets

The following are the objectives of the Awareness Training Program:

- Promote and present new employee environmental orientation classes by March 1998.
- Create an environmental awareness with all employees by using various communications media such as Newsbreaks, Postal Link, Metro Leader, Postal News, etc.
- Each facility environmental coordinator take at least the classes on Recycling/Waste Minimization, Basic Environmental Laws and Regulations, and Environmental Quality Assurance Reviews.
- Track training through PEDC with specific course numbers
- Set up environmental displays where applicable and promote environmental stamp releases as appropriate.

To accomplish the objectives associated with the program, it is necessary to develop targets and a strategy, identify responsibility, and determine the priority of the program. The following table shows the action plan associated with accomplishing the objectives of this program.

Action Plan				
Objective	**Target**	**Strategy**	**Responsibility**	**Priority**
Create an environmental awareness for Employees	• Conduct Postmaster training within 12 months of Guide's Issuance • Provide adequate and site specific training for DECCs and employees	Conduct training needs assessment annually	DECC	B

Priority Key

A = Absolute first priority: Postponement will significantly hurt our position
B = Highly desirable: Postponement will adversely affect our position
C = Desirable: If funds were to be available to enhance our position

Accountability and Responsibility

Specific roles and responsibilities associated with the Awareness Training Program are highlighted in the following table.

Roles and Responsibilities of Environmental Coordinators

AECC	DECC	FEC
• Promote awareness and participation of union, individual employees, and management in environmental programs	• Coordinate program development and implementation with AECC • Develop material for employee environmental orientation classes • Ensure all communication materials are appropriate for the intended audience • Promote multi-media training for all employee levels on environmental activities. • Coordinate with AECC to identify opportunities for environmental displays and promote environmental stamp releases as appropriate	• Participate in communicating environmental programs to employees

Insights and Reminders

- Enhance environmental awareness of all employees through the use of various communication media.
- Provide site-specific environmental training.
- Identify opportunities for environmental displays.

Quality Assurance Reviews

Scope

Multi-media Environmental Quality Assurance Reviews (QAR) need to be conducted at all USPS facilities in Capital Metro to determine the overall status in relation to regulatory compliance and USPS policies. A QAR provides an environmental baseline for setting benchmarks for tracking progress and determining the most effective and efficient pathways to meet regulatory compliance. High-risk facilities will be reviewed first.

Multi-media Environmental Quality Assurance Reviews (QAR) need to be conducted at all USPS facilities in Capital Metro.

A great deal of coordination will be necessary with Plant support personnel, especially in maintenance and safety, to correct any deficiencies found. In many cases, plans will have to be developed to correct problem areas, and permits will have to be obtained to meet environmental compliance requirements.

Objectives and Targets

The following are the objectives of the QAR Program:

- Complete QARs at all P&DCs by the end of calendar year 1997.
- All offices and stations surveyed for lead paint, lead in water, radon, and asbestos by the end of 2002.
- Completion of the Pollution Prevention plan by March 1998.
- Develop audit protocols for the Postmaster's handbook.

To accomplish the objectives associated with the program, it is necessary to develop targets and a strategy, identify responsibility, and determine the priority of the program. The following table shows the action plan associated with accomplishing the objectives of this program.

Action Plan				
Objective	**Target**	**Strategy**	**Responsibility**	**Priority**
Perform self reviews	Track corrective actions by category	Complete survey annually	DECC	A

Priority Key

A = Absolute first priority: Postponement will significantly hurt our position
B = Highly desirable: Postponement will adversely affect our position
C = Desirable: If funds were to be available to enhance our position

Accountability and Responsibility

Specific roles and responsibilities associated with the QAR Program are highlighted in the following table.

Roles and Responsibilities of Environmental Coordinators

AECC	DECC	FEC
• Coordinate program development and implementation with DECC	• Coordinate program development and implementation with AECC • Provide copy of current QAR results to AECC for use in developing pollution prevention plans • Conduct QARs every three years • Conduct QARs at each of the P&DCs and VMFs	• Support the DECC with the coordination and establishment of site specific programs

Insights and Reminders

- Complete Pollution Prevention Plan by March 1998.
- Conduct quality assurance reviews annually.
- Coordinate with plant support personnel, especially in maintenance and safety, to correct deficiencies.

Energy and Water Conservation

Scope

Significant savings can be realized through properly conducted energy and water conservation programs. Currently, several activities are planned or underway to help meet the Energy Policy Act (1992) requirement of a 20% reduction in energy use by the year 2000. Energy and water conservation surveys are needed for many facilities within Capital Metro Operations to determine program status. There are expected to be numerous opportunities to institute conservation programs once the current status has been benchmarked.

Activities are planned or underway to help meet the Energy Policy Act (1992) requirement of a 20% reduction in energy use by the year 2000.

Current plans to move forward with energy and water conservation include development of new energy saving technologies and installation of energy saving devices. An additional project involves coordinating with energy providers to promote a Shared Energy Savings project, which will benefit both the USPS and the energy provider. The installation of state-of-the-art energy conservation systems and controls will have an appreciable effect on cost savings over a relatively short period of time.

The purchase and retro-fitting of energy consuming systems will have to be carefully coordinated. The potential savings or value added to any program must be thoroughly explained at all employee levels to achieve maximum buy-in. Energy saving programs must also be carefully coordinated with the suppliers of those utilities in order to promote a "win-win" situation, since fewer utility units will be purchased. Other factors influencing success of the program include funding and personnel resources.

Objectives and Targets

The following are the objectives of the Energy and Water Conservation Program:

- To have energy conservation surveys conducted in the major facilities by the end of calendar year 1997.
- To replace current lighting systems with more energy efficient technologies such as LED by June 1998.
- To have water conservation controls in place at the major facilities by the end of calendar year 1997.
- Establish an energy conservation committee.

To accomplish the objectives associated with the program, it is necessary to develop targets and a strategy, identify responsibility, and determine the priority of the program. The following table shows the action plan associated with accomplishing the objectives of this program.

Action Plan				
Objective	**Target**	**Strategy**	**Responsibility**	**Priority**
Energy Conservation	20% reduction in BTUs by 2000 over 1985	Conduct survey 1998	DECC	B

Priority Key

A = Absolute first priority: Postponement will significantly hurt our position
B = Highly desirable: Postponement will adversely affect our position
C = Desirable: If funds were to be available to enhance our position

Accountability and Responsibility

Specific roles and responsibilities associated with the Energy and Water Conservation Program are highlighted in the following table.

Roles and Responsibilities of Environmental Coordinators

AECC	DECC	FEC
• Establish energy conservation committee • Support energy reduction initiatives with DECC	• Coordinate program development and implementation with AECC • Conduct energy conservation survey by the end of calendar year 1997	• Replace current lighting system with more energy efficient technologies. • Implement water controls in facilities by end of calendar year 1997

Insights and Reminders

- Conduct energy and water conservation survey by 1998.
- Coordinate with energy providers to promote a Shared Energy Saving Project.

1 Background of Environmental Management Systems

- The Development of EMS Standards ..... page 7
- EMS Standards and Other Environmental Management Tools 7
- System Assessment and Environmental Performance 8
- Reasons to Seek EMS Registration 9
- Cost and Benefits of an EMS 9

1.1 The Development of EMS Standards

The world's first standard for environmental management systems (EMS) - BS 7750 - was developed and published by the British Standards Institution (BSI) in 1992. This standard was the model for the ISO 14000 Series developed by the International Organization for Standardization (ISO). ISO 14001, which establishes the requirements for an EMS, was finalized in 1996. BS 7750 was also the basis for the European Union's Eco-Management and Audit scheme, known as EMAS.

ISO is an international standard and therefore must incorporate the different interests of many countries. This standard clearly has the weakest requirements. By contrast, EMAS is the most stringent and detailed standard reflecting the high environmental standards of German interests and companies which played a key role developing it.

Because ISO 14001 and EMAS are both based on BS 7750, all three standards are quite similar in their approach. If your organization complies with BS 7750 today, little effort will be needed to fullfill the requirements of ISO 14001 or EMAS. Be aware however, that EMAS emphasizes public environmental reporting. A more detailed analysis of similarities and differences as well as a table that lists the corresponding parts of each standard can be found in the appendix (page 68).

1.2 EMS Standards and Other Environmental Management Tools

Today there are two major areas in the evaluation of environmental management practice. One area focuses on organizational issues, and the other on products, services and processes. The ISO 14000 series covers the following topics (an overview of the ISO 14000 Series is given in chapter 5.1 on page 66):

- Organization Evaluation
  - Environmental Management Systems (ISO 14001, 14004)
  - Environmental Performance Evaluation (ISO 14014, 14015, 14031)
  - Environmental Auditing (ISO 14010, 14011, 14012, 14013, 14014)
- Products, Services and Processes
  - Life Cycle Assessment (ISO 14040, 14041, 14042, 14043)
  - Environmental Labeling (ISO 14020, 14021, 14022, 14023, 1402X)
  - Environmental Aspects in Product Standards (ISO 14060)

An overview of environmental management is given in Figure 1.

NOTE: This publication mainly deals with environmental management systems standards [ISO 14001, 14004] and to some extent with performance evaluation and auditing.

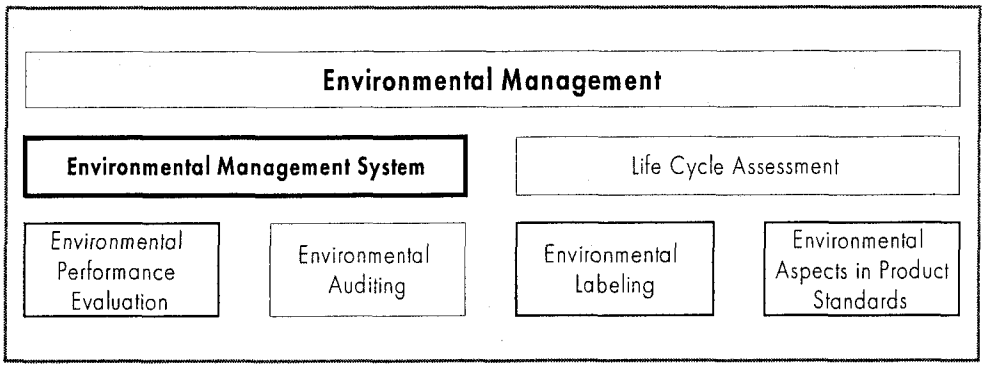


Figure 1: Environmental Management

1.3 System Assessment and Environmental Performance

For a better understanding of EMS standards you should consider the following point:

EMS standards are **process** - **NOT performance** - standards!

In other words these standards do NOT tell organizations what environmental performance they must achieve (besides compliance with environmental regulations). Instead, the standards describe a system that will help an organization to achieve its own objectives and targets. The assumption is that better environmental management will lead indirectly to a better environmental performance [TIBOR/FELDMAN 1996].

1.4 Reasons to Seek EMS Registration

You can implement an EMS that is in line with one of the EMS standards without external certification. Once there is a clear reason to demonstrate conformance to third parties, external certification and registration becomes a factor. Some situations where certification could become important are [TIBOR/FELDMAN 1996]:

- A customer requires an EMS certificate as a condition to sign a contract.
- Your organization supplies to a customer who strongly suggests you get registration.
- A government provides benefits to registered organizations.
- You have a site in the European Union, where market pressure or the regulatory environment forces you to get registration or certification.
- You export to markets where EMS registration is a de facto requirement for entering the market.
- You expect to gain a competitive advantage through EMS registration
- Your major stakeholders (local community, shareholders, unions, etc.) expect environmental excellence and an EMS registration is the way to demonstrate it.

If one of the reasons above applies in your case, then you should decide whether to get registration for the organization as a whole or just for parts of it. If you are already ISO 9000-certified, it makes sense to define its scope in a similar manner [TIBOR/FELDMAN 1996]. If you go for a site by site registration, you have the advantage of not losing the registration for your whole organization if one of the sites does not comply with the requirements of the standard. Also, this way the process of implementing, certifying and registering the EMS is broken down into smaller projects that are easier to handle.

1.5 Costs and Benefits of an EMS: Creating Shareholder Value and Reducing Environmental Impact by Implementing an EMS

The implementation of an EMS has a wide variety of impacts on different levels of a company. There are no general answers to the question of costs and benefits of an EMS. These differ for every company. Nevertheless, research conducted in England and Thailand by the School of Management strongly indicates that organizations in industrialized countries spend more on software (e.g. training, environmental handbooks etc.), while organizations in newly industrializing countries spend more on hardware (e.g. investment in pollution abatement equipment to meet environmental regulations or investments in recycling, waste management etc.).

The main reason for implementing an EMS standard is the need of companies to provide assurance to stakeholders regarding compliance to environmental regulations. Beyond legal compliance, an EMS certification gives a company a competitive advantage in international trade and is a potential source of productivity improvement. Nevertheless, before implementing an EMS, you should analyse the potential costs and benefits to make sure that the system provides a positive economic return. If environmental managemement does not increase the value of a company, financial markets will not finance the strategy and the company will be pushed out of the market. Convincing financial markets of the profitability of environmental management is crucial for its sucess.

A useful approach for analysing the costs and benefits of an EMS is the shareholder value concept [RAPPAPORT 1986, COPELAND 1990]. This concept takes a long-term perspective and clearly shows the sensitivities of different factors - so-called value drivers - on corporate or shareholder value (if you are not familiar with the concept see the remark on page 88).

By analysing the economic effect of management decisions regarding environmental issues on value drivers, the costs and benefits of an EMS, in terms of decreasing or increasing shareholder value, can be quantified. Value creation along with reduced environmental impact added can be regarded as sustainable growth from a company perspective.

A closer look at the factors which increase or decrease shareholder value and discounted free cash flows, shows that the following management decisions and value drivers are linked with value creation [for more information about value driver analysis see RAPPAPORT 1986, COPELAND 1990]:

<table>
<tr><th>Managment Decisions</th><th>Operating</th><th>Investment</th><th>Financing</th></tr>
<tr><td rowspan="3">Value Driver</td><td>Sales Growth Rate</td><td>Investment in Working Capital</td><td rowspan="3">Cost of Capital (Debt and Equity)</td></tr>
<tr><td>Profit Margin</td><td rowspan="2">Investment in Fixed Capital</td></tr>
<tr><td>Tax Rate</td></tr>
<tr><td rowspan="2">Value Creation
(Corporate Value)</td><td colspan="2">Free Cash Flow (FCF)</td><td>Discount Rate</td></tr>
<tr><td colspan="3">Σ Discounted Free Cash Flow (DFCF)</td></tr>
<tr><td>Sharholder Value (SV)</td><td colspan="3">Corporate Value - Debt</td></tr>
</table>

Table 1: Management Decisions and Corporate Value

POSITIVE Impact on Shareholder Value	
Potentially Affected Value Driver (c.p.)	***Examples of Potential Effects of Implementing an EMS***
Profit Margin	• optimized products and production processes lead to less material input and lower costs • cost savings due to reuse and recycling result in less excess material input and lower material costs • cost savings due to waste reduction, reuse and recycling result in lower waste disposal costs • lower transportation and storage costs due to less material and energy input • easier compliance with environmental standards, lower compliance costs • lower risk of redesigning costs due to changing regulations or customer perception • lower environmental impact leads to reduced charges, pollution penalties • lower environmental risk leads to lower insurance costs and compensation payments
Sales Growth Rate	• better knowledge about products and production processes leads to innovation and better quality • renovation of product portfolio leads to higher competitiveness • improved public image leads to higher acceptance and higher sales • new markets due to product innovation (e.g. combined with eco-labels) • ensured access to markets due to product innovation (e.g. combined with eco-labels) • environmental information/consulting improves client relations
Investment in Working Capital	• less excess material and energy due to waste prevention and energy savings program leads to less working capital
Investment in Fixed Capital	• focus on preventing environmental impact leads to less end-of-the-pipe investments • lower warehousing investments due to low-risk material usage • easier to obtain permits and authorization
Tax Rate	• obtaining tax relief due to lower environmental risk
Cost of Capital	• increased awareness of environmental problems and reduced environmental risk attracts shareholders and investors which leads to lower cost of debts and equity • subsidies due to overfullfillment of environmental regulations • weak loans due to overfullfillment of environmental regulations

Table 2: Environmental Measures and the Potential *Positive* Impact on Shareholder Value

Analysing the costs and benefits of implementing an EMS (or any environmental measure) is based on quantitative estimates of the effect of these value drivers. The

following tables provide some examples of potentially positive and negative impacts of an EMS implementation on shareholder value.

If the EMS is expected to increase shareholder value you should start the process by providing top management with basic EMS knowledge. The decision of whether or not to implement an EMS has a wide range of implications that will change the way an organization does business. Therefore, top management needs to know exactly what they are committing themselves to, before going for one of the EMS standards. A presentation and discussion of the basic modules of an EMS at the top level of a company is absolutely necessary for sucessful implementation. An overview of the modules can be found in chapter 2 on page 12.

NEGATIVE Impact on Shareholder Value	
Potentially Affected Value Driver (c.p.)	***Examples of Potential Effects of Implementing an EMS***
Profit Margin	• additional costs of implementing an EMS reduce profit margin • investment in pollution abatement technology to comply with environmental regulations leads to higher production costs
Sales Growth Rate	• investment in EMS and pollution abatement technology to comply with environmental regulations leads to higher cost and market prices
Investment in Working Capital	• environmentally friendlier, but more expensive materials and energy
Investment in Fixed Capital	• investment in pollution abatement technology to comply with environmental regulations
Cost of Capital	• because of the public environmental report, financial markets suddenly realize the environmental risk of an organization, its products and services and ask for a premium

Table 3: Environmental Measures and the Potential *Negative* Impact on Shareholder Value

2 Overview: Modules of an Environmental Management System

An Environmental Management System that is in line with current EMS Standards like ISO 14001, BS 7750 or EMAS consists of the following seven modules:

- Module 1: Commitment and Environmental Policy ..... page 14
- Module 2: Initial Environmental Review 14
- Module 3: Planning the Environmental Policy 14
- Module 4: Implementing the Environmental Policy 15
- Module 5: Measurement and Evaluation 16
- Module 6: Audits and Review 16
- Module 7: External Environmental Communication 17

The following figure gives an overview of the modules and their interactions.

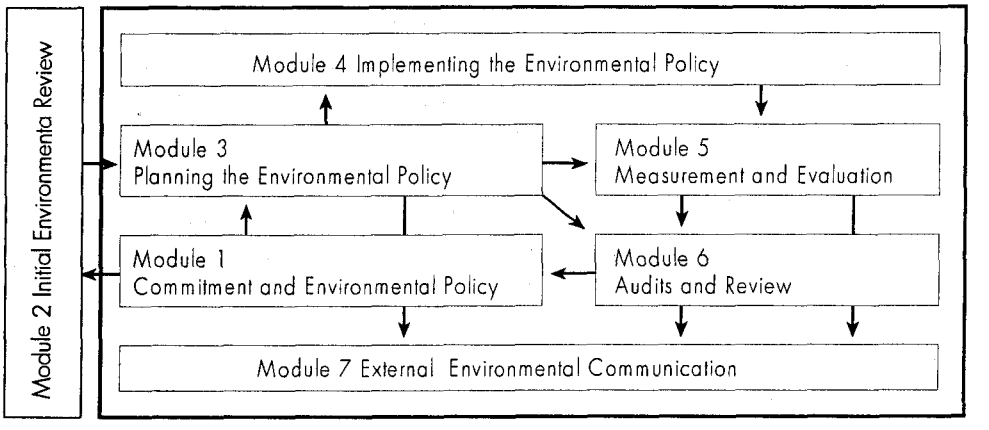


Figure 2: Modules of an Environmental Management System

Below is a short description of each module. For organizations that have already implemented one of the EMS standards and want to switch from one standard to another, more information about the corresponding modules for different EMS standards is also provided (see appendix on page 68).

2.1 Module 1: Commitment and Environmental Policy

The starting point of an EMS is top management commitment and an environmental policy. The policy is a written document, with two components: a) the rationale for the company to become „green" and b) the overall intentions of the organization regarding environmental issues. The policy contains a commitment to comply with all environmental regulations, to prevent pollution and to initiate a process of continuous improvement. An environmental policy is unique to an organization. It must be communicated to all members of the organization and made available to the public. The environmental policy is the basis for developing a consistent structure of environmental objectives and targets for an organization.

Modul 1: ..... page 19

2.2 Module 2: Initial Environmental Review

Before an organization can plan and implement an environmental policy, an initial environmental review should be made. This review will provide an overview of the environmental issues a company is facing. In this initial environmental review every aspect of the future EMS is checked. The organization then knows the strengths and weaknesses of its present operations and its management systems. This review and the policy statement are the basis for planning the implementation of the environmental policy.

Modul 2: ..... page 25

2.3 Module 3: Planning the Environmental Policy

In the planning stage, all of an organization's interactions with the environment are identified. Legal and other requirements that an organization must meet are determined. Environmental objectives and targets are defined and environmental management programs are developed to achieve these targets. The environmental management programs then assign responsibilities and name the means and time frame by which the targets will be achieved.

Modul 3: ..... page 34

2.4 Module 4: Implementing the Environmental Policy

The implementation and operational components of an EMS take the most time and effort within an EMS project. The following aspects are covered in this stage:

- The roles, responsibilities and authority of personnel whose activities have an impact on the environment are defined, documented and communicated to all members of the organization. In addition, resources for the implementation and maintenance of the EMS are provided. A special management representative with the responsibility and authority to enforce the EMS requirements is appointed. This management representative reports the environmental performance of the organization directly to top management.

- Management must ensure that personnel throughout the organization are aware of the environmental policy, the environmental management programs and the actual or potential impact of their activities on the environment. All personnel with a significant contribution to environmental performance need to be adequately trained to handle the environmental aspects of their activities. The organization must ensure that these people have the competence to deal with their responsibilities either through education, training and/or experience.

- To integrate relevant environmental aspects into daily business information.

- To ensure that external auditors can certify the management system according to one of the current EMS standards, the EMS must be well-documented. This documentation includes a description of the basic elements of the system and their interaction. It also points to related documents. There is no need to develop an EMS handbook, but it is common practice to do so. The documents related to the EMS must be reviewed, revised and approved on a regular basis so that up-to-date information is available on the task or work activity being performed.

- To make sure that the environmental policy is implemented and the objectives and targets met, an organization must identify processes and activities that have a significant impact on the environment. The organization must ensure that these activities or processes are conducted as intended (operational control). The organization must also identify environmental aspects of the goods and services it uses, and communicate its environmental requirements to its suppliers and contractors.

- The organization must identify the potential for accidents and emergency situations (emergency preparedness) and develop appropriate procedures to

respond to these. This includes the prevention and mitigation of the environmental impact added. These procedures need to be communicated internally and tested to make sure that the response is effective and efficient.

Modul 4: ..... page 39

2.5 Module 5: Measurement and Evaluation

After implementing the environmental policy, management needs to measure environmental interventions and their impact on the environment. This is done by building up an environmental effects register (environmental inventory). All equipment used for monitoring and measuring must be accurate and calibrated on a regular basis. To check the compliance status of an organization, additional information about regulations and other requirements is needed. A so-called „environmental regulations register" is often installed and maintained for this purpose. Evaluation assesses environmental performance against the environmental targets and objectives.

Responsibilities and authority need to be defined to deal with non-compliance within the EMS. This includes specifying the actions to be taken to correct an undesirable situation and to prevent future non-compliance.

Modul 5: ..... page 42

2.6 Module 6: Audits and Review

Audits determine the capability of the EMS to achieve the organization's environmental objectives and targets. The EMS must be audited on a regular basis to ensure that the system is working as intended. The audit provides the information which top management needs to review the EMS. This review is a check to ensure that the system is operating effectively. This top management review also addresses changes needed in the environmental policy, objectives and targets or in the EMS itself.

The review helps to ensure that the following functions are accomplished:

- meet third party expectations (stakeholders)
- take into account new businesses or operations
- consider changes in technology
- implement audit findings or
- improve environmental performance

To make sure that the EMS can be audited by external authorities, the system must be documented and the organization must keep records related to the EMS. These records must be identified, collected, stored and maintained to provide objective evidence of compliance with the EMS standard, including legal and other requirements.

Basic records include:

- training records,
- measurement and evaluation results,
- management review records and
- audit results.

Modul 6: ..... page 58

2.7 Module 7: External Environmental Communication

One of the key success factors of an EMS is effective communication of an organization's activities regarding environmental issues. There are two main communication directions:

- communicating environmental aspects of activities, products and services to stakeholders on a continuous basis
- providing periodic information with an environmental report

Continuous communication should target customers, employees, suppliers, authorities, neighbours, the media and the general public. This is not one-way communication. A frank relationship with these stakeholders can only be achieved with dialogue. Here, the organization should focus on the values and interests of each specific group. To open up this dialogue, an organization should consider the following measures:

- Identify a contact person to handle inquiries on environmental issues.
- Determine the procedure for dealing with external inquiries.
- Involve the PR department in compiling information about the organization's environmental protection scheme.
- Involve the marketing department in compiling information for the customer about environmental aspects of using and disposing of the product.

Periodic information about environmental issues is normally provided with an environmental report. This comprehensive report is compulsory only if an organization chooses to comply with EMAS. Neither ISO 14001 nor BS 7750 requires an

environmental report (for a comparison see the appendix on page 68). Nevertheless, compiling an environmental report is good management practice and is often required by external stakeholders (e.g. shareholders, financial analysts).

An environmental report covers the following topics [EMAS]:

- Environmental policy
- Environmental strategy
- Description of the EMS components
- Policy regarding environmental aspects related to products and services
- Listing of all inputs (material and energy) and outputs (air pollution, sewage, waste) over the respective period of time (environmental effects register)
- Assessment of compliance with environmental regulations (environmental regulation register)
- Evaluation of environmental performance
- Description of the environmental management programs, including objectives, targets, measures and schedule
- Relationships with external stakeholders
- Audit report findings

Not mentioned in any of the EMS standards, but nevertheless important, is a communication strategy that takes into account the interests of financial stakeholders like shareholders, banks, insurers and financial analysts [for an EMS concept from the financial analyst's perspective see EFFAS 1994]. Management must show that the chosen environmental strategy is efficient and effective and is creating shareholder value. An environmental strategy that does not create future free cash flow is economically unsustainable.

Modul 7: ..... page 60

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Gap Analysis

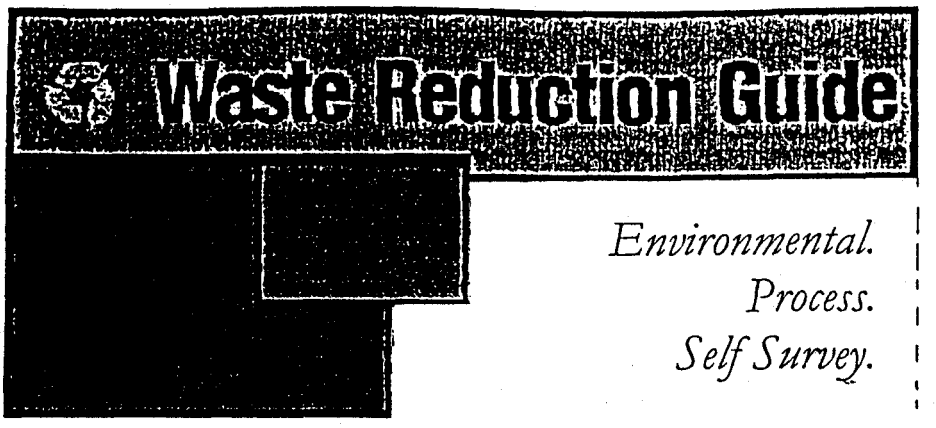
"Waste Reduction Guide - Environmental Process Self Survey" from TN Valley Authority

"ISO 14001 EMS Self Assessment Checklist" from GEMI

"EMS/ISO14000 Gap Analysis Tool Suite" from Lake Erie Manufacturing Extension Partnership

"Initial Environmental Review Questionnaire" from Ellipson Management Consultants

Comments:



About this Self Assessment Survey

Conducting business in an environmentally pro-active manner can create many benefits for the company and its stakeholders. Among these benefits are competitive advantages such as cost savings and improved efficiency, but other fringes like favorable public perception may also be enjoyed. This survey incorporates the tenets of ISO 9000 and ISO 14000.

TVA encourages you to take the time to complete this survey in order to better judge how your company ranks in environmental competitiveness.

Permission to duplicate all or in part with appropriate credit noted freely given.

Acknowledgments

This document was developed with funding from the U.S. Environmental Protection Agency - Center for Environmental Research Information in cooperation with the Tennessee Valley Authority by the Southeast Manufacturing Technology Center

How Does Your Company Compare ?

1. Is there a formal document or plan that clearly describes the Company's environmental commitments?	Meets none of the intent	Meets part of the intent						Meets full intent	RECORD SCORE HERE
	0	1	2	3	4	5	6	7	8	

	Y	N	N/A
Does the organization have an environmental policy?	○	○	○
Is this plan proactive ?	○	○	○
Has it been approved by the Board of Directors or other managing body?	○	○	○
Does the policy state the organization's commitment to monitor & meet or better the legal requirements ?	○	○	○
Have all potential environmental aspects of the organization's activities been included in the plan?	○	○	○

2. Does the environmental plan or policy address both short and long term goals	Meets none of the intent	Meets part of the intent						Meets full intent	RECORD SCORE HERE
	0	1	2	3	4	5	6	7	8	

	Y	N	N/A
Does the policy support continuous improvements?	○	○	○
Does the policy drive the setting of environmental objectives?	○	○	○
Will the organization's activities, products or services create any change (positive or negative) to the environment?	○	○	○
Does the location of the operations of the company require any special environmental considerations?	○	○	○

3. Has someone been named to manage the company's environmental policy?	Meets none of the intent	Meets part of the intent				Meets full intent	RECORD SCORE HERE
	0	1	2	3	4	5	

	Y	N	N/A
Has someone been identified and given authority to oversee and implement the company's environmental plan ?	○	○	○
Does the policy guide the responsible person toward the selection of the best available technology and management practices?	○	○	○
How does the organization identify & allocate the human, technical, & financial resources necessary to meet its environmental commitments?	○	○	○

4. Is a core management group involved in reviewing the environmental plan and policies at least annually?	Meets none of the intent	Meets part of the intent						Meets full intent	RECORD SCORE HERE
	0	1	2	3	4	5	6	7	8	

	Y	N	N/A
Has the environmental management system been integrated into the overall business plan?	○	○	○
Is there a process to balance and resolve conflicts and priorities ?	○	○	○
Is there a process to evaluate the environmental resources (human, technical, financial) associated with new capital projects?	○	○	○
Are the appropriate people involved in the review of the environmental management system and follow-up?	○	○	○

5. Are procedures in place to track the costs and benefits (return on investment) for the company's environmental activities?	Meets none of the intent	Meets part of the intent			Meets full intent
	0	1	2	3	4

RECORD SCORE HERE

Y N N/A

Will any intended changes or additions to activities, products, or services alter the environmental conditions already being monitored ?

Not Mod Very Sig Sig Sig

How significant or severe are the potential environmental impacts should a process failure occur?

Not Occ Very

How frequently will the situation arise that could lead to an impact to the environment?

Y N N/A

Are periodic reviews conducted?

6. Are there baseline measurements in place to monitor continuous improvements of the company's environmental performance?	Meets none of the intent	Meets part of the intent						Meets full intent
	0	1	2	3	4	5	6	7

RECORD SCORE HERE

Y N N/A

Is environmental performance regularly monitored?
Have specific environmental performance indicators been established which relate to the company's goals?
Is the company currently performing as planned?
Is data well organized and easily accessible?

7. Are all critical environmental issues adequately addressed?	Meets none of the intent	Meets part of the intent					Meets full intent
	0	1	2	3	4	5	6

RECORD SCORE HERE

Y N N/A

Are alternatives designated?
Are all activities properly staffed ?
Are there periodic reviews of the environmental management system?
Are all control processes in place to regularly calibrate and sample measuring and monitoring equipment and systems?
Please Define: _____

_____

8. Does your facility have a process by which an employee can recommend changes to a process for purposes of minimizing waste generation or preventing unnecessary pollution?	Meets none of the intent	Meets part of the intent					Meets full intent
	0	1	2	3	4	5	6

RECORD SCORE HERE

Y N N/A

Do you conduct team meetings?
Is there a suggestion box supplied with forms and pencils?
Are your employees informed about on-site environmental issues?
Is information given to contractors about on-site environmental issues?

9. Have all the release points been identified for all emissions and discharges and is an inventory kept from each area of responsibility?	Meets none of the intent	Meets part of the intent						Meets full intent	RECORD SCORE HERE
	0	1	2	3	4	5	6	7	

	Y	N	N/A
Does this include fugitive emissions and/or discharges?	○	○	○
Is there a system for assessing the impact of the emissions or discharges from these points?	○	○	○
Do any of the site's release points have specific or regulated maximum limits?	○	○	○
Are release points monitored?	○	○	○
Does the inventory contain qualitative and quantitative information?	○	○	○
Does the inventory include or refer to relevant environmental or health and safety regulations for each type of emission or discharge?	○	○	○
Does the inventory reference legislation, codes, regulations and practices that may be relevant to emissions/discharges?	○	○	○
Does the inventory identify the limits or quantities of materials permissible?	○	○	○

10. Do you have a Waste Reduction Plan?	Meets none of the intent	Meets part of the intent								Meets full intent	RECORD SCORE HERE
	0	1	2	3	4	5	6	7	8	9	

	Y	N	N/A
Is it written?	○	○	○
Have all employees been trained regarding the company's plan?	○	○	○
Is there an employee incentive for cost saving Waste Reduction ideas?	○	○	○
Have you documented and characterized all your plant's waste?	○	○	○
Do you track your monthly percentage total waste and give this feedback to your employees?	○	○	○
Do you have a means of monthly tracking your percentage total waste?	○	○	○
By process area?	○	○	○
Can you track the individual process sources for the waste generation?	○	○	○
Have you initiated or completed a cost saving Waste Reduction project in the last 3 months?	○	○	○
Do you have a list of identified Waste Reduction projects prioritized by return on investment (ROI) criteria?	○	○	○
Have you committed to initiate all Waste Reduction projects that have a high Return on Investment?	○	○	○

Total Score >>>>>>> ☐

What Does Your Score Mean?

A maximum score for question #1 is 8 points, for #2 is 8 points, for #3 is 5 points, for #4 is 8 points, for #5 is 4 points, for #6 is 7 points, for #7 is 6 points, for #8 is 6 points, for #9 is 7 points, and for #10 is 9 points. A perfect score would be 68.

52-68 - Your company is environmentally competitive, making the most of your product, activity, or service.

38-51 - Your company recognizes the benefits of sound environmental processes. Continuous improvement will increase those benefits.

20-37 - You may have recognized the benefits, but you are missing many opportunities to save money.

0-19 - Environmental issues are costing your company money. Begin incorporating process changes to minimize wastes and raw materials and proceduralize environmental operations.

ISO 14001
Environmental Management System Self-Assessment Checklist (March 1996)



Global Environmental Management Initiative (GEMI)

ISO 14001
Environmental Management System
Self-Assessment Checklist

March 1996



Global Environmental Management Initiative (GEMI)

2000 L Street NW, Suite 710

Washington, DC 20036

Tel: 202-296-7449 Fax: 202-296-7442

Email: GEMI@worldweb.net

http://www.gemi.org

About the Global Environmental Management Initiative

The Global Environmental Management Initiative (GEMI) is a non-profit organization of leading companies dedicated to helping business achieve environmental, health and safety excellence. Through the collaborative efforts of its members, GEMI promotes a worldwide business ethic for environmental management and sustainable development through example and leadership. GEMI's member companies as of March 1996 are:

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Representatives from several GEMI members companies participated in the preparation of this document. Most notably, the primary authors of the document are:

Clinton Allen, Bristol-Myers Squibb Company
Paul Cullen Beatley, Environmental Policy Centre Europe
Thierry Dumortier, Environmental Policy Centre Europe
Michael Fisher, The Procter & Gamble Company
Mark Harvey, Georgia-Pacific Corporation
Patricia Hintzel, Tenneco
Michele Malloy, Tenneco
Jennifer Olha, Environmental Policy Center
Vivian Pai, Johnson & Johnson
Maria Rasmussen, Eastman Kodak Company
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Vicki Sullivan, Southern Company Services
Clarice Taylor, Colgate-Palmolive Company

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Disclaimer

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The development and publication of this checklist does not, in any manner, advocate or endorse the approval, content, or registration of the ISO 14001 standard by GEMI or its member companies.

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ISO 14001
Environmental Management System
Self-Assessment Checklist

PURPOSE OF THIS CHECKLIST

This checklist and primer has been developed to improve facility managers' understanding of the requirements and elements of the environmental management system outlined in the ISO 14001 draft international standard. It is designed to allow for a rapid self-assessment of an organization or facility to determine how closely existing management practices and procedures correspond to the elements of the standard. The criteria of the draft standard have been rephrased in the format of a simple questionnaire, with a three-part scoring system, as explained in this document. In addition to a brief guide to self-scoring, a fuller description of what is required by the standard's criteria is included in the appendix. In this format, even with limited background knowledge of the ISO 14001 standard, a facility or other business manager can quickly review existing operations to determine how they measure up to the standard. This in turn can serve as the starting point of a "gap analysis" to identify management tools or system elements that might usefully be implemented in the organization to help improve overall environmental performance.

INTRODUCTION

Representatives from some fifty countries around the globe have recently agreed to the draft international standard (DIS) on environmental management systems (ISO/DIS 14001) issued by the International Organization for Standardization (ISO). It is expected that the standard will be formally adopted in 1996. It is intended that the implementation of an environmental management system (EMS) based on this standard will result in improved environmental performance. The standard is based on the concept that the organization will periodically review and evaluate its environmental management system in order to identify opportunities for improvement and their implementation. Improvements in its environmental management system are intended to result in additional improvements in environmental performance. When the ISO standard is formally adopted, it is anticipated that existing national EMS standards, such as BS 7750 (UK), IS 310, (Ireland), NF X30-200 (France) and UNE 77-801(2)-94 (Spain) will be withdrawn and replaced by the single international EMS standard. Adoption by the European Council of ISO 14001 as the standard to implement Council Regulation EEC/1836/93 on a Community Environmental Management and Audit Scheme (EMAS) is not yet decided.

Why introduce an environmental management system?

The environment has become an important factor in the decision-making process of companies around the world. Environmental issues are becoming more complex and interconnected. Traditional ways of addressing environmental issues - in a reactive, ad-hoc, end-of-pipe manner - are proving to be highly inefficient. As competition increases within the expanding global market, environmental laws and regulations are setting new standards for business in every region of the world. But good environmental performance is not just a legal or moral obligation. It also makes good business sense. Reducing pollution means increasing efficiency and wasting fewer resources. Improved health and safety conditions result in

a more productive workforce. Supplying goods and services that respect the environment helps to expand markets and improve sales. In short, companies become more competitive when they practice good environmental management.

On the other hand, the risks posed by mismanaging environmental issues are complex and varied. They include the obvious, such as damage to the environment with negative consequences for the overall standard of living. They can also include damage to a company's reputation and a resulting loss of confidence among customers, neighbors and shareholders, the loss of market share, and, of course, legal liabilities.

Such risks cannot be dealt with on an ad-hoc basis. As with any financial or commercial risk, only a well-founded and properly implemented management approach can provide a measure of confidence that good performance is not an accident and that poor performance can be identified and rectified. By properly implementing an appropriate environmental management system (EMS), any company, large or small, can ensure that they effectively manage environmental risks while identifying and exploiting the myriad opportunities proper environmental management can bring. Such a systematic approach to environmental management is at the very heart of the ISO 14001 standard. This checklist is intended to allow managers of industrial facilities to review existing operations and management approaches against this standard to determine how well they measure up to what is soon to be considered as "state-of-the-art" in effective approaches to environmental management.

ELEMENTS OF ISO 14001

ISO/DIS 14001 is one of a series of emerging international environmental management standards aimed at promoting continual improvement in company environmental performance through the adoption and implementation of an environmental management system. The (draft) standard specifies the core elements of an EMS, but contains only those elements that may be objectively audited for certification or self-declaration purposes. A companion guidance standard, ISO/DIS 14004 includes examples, descriptions and options that aid in the implementation of an EMS and in integrating the EMS into overall management practices. It is not intended for use by certification/registration bodies.

ISO/DIS 14001 defines an overall environmental management system, closely modeled on the ISO 9000 quality systems standard, and covers the following key elements:

- **Establishment of an appropriate environmental policy** that is documented and communicated to employees and made available to the public, and which includes a commitment to continual improvement and pollution prevention, regulatory compliance and a framework for setting objectives;
- **A planning phase** that covers the identification of the environmental aspects of the organization's activities, identification and access to legal requirements, establishment and documentation of objectives and targets consistent with the policy, and establishment of a program for achieving said targets and objectives (including the designation of responsible individuals, necessary means and timeframes);
- **Implementation and operation of the EMS** including the definition, documentation and communication of roles and responsibilities, provision of appropriate training, assurance of adequate internal and external communication, written management system documentation as well as appropriate document control procedures, documented procedures for operational controls, and documented and communicated emergency response procedures;
- **Checking and corrective action procedures**, including procedures for regular monitoring and measurement of key characteristics of the operations and activities, procedures for dealing with situations of non-conformity, specific record maintenance procedures and procedures for auditing the performance of the EMS;
- **Periodic management reviews of the overall EMS** to ensure its suitability, adequacy and effectiveness in light of changing circumstances.

The EMS as outlined in ISO 14001 provides a structured process for the achievement of continual improvement, the rate and extent of which is determined by the organization in light of economic and other circumstances. Although some

improvement in environmental performance can be expected due to the adoption of a systematic approach, it should be understood that the EMS is a tool which enables the organization to achieve and systematically control the level of environmental performance that it sets itself. The establishment of an EMS will not, in itself, necessarily result in an immediate reduction of adverse environmental impact. Indeed, care needs to be taken that the mere establishment of an EMS does not lull the organization into a false sense of security. But effectively used, an EMS should enable an organization to improve its environmental performance and avoid or reduce adverse environmental impacts over time.

An organization has the freedom and flexibility to define the boundaries of its system and may choose to implement an EMS throughout the entire organization, or within specific operating units or activities of the organization. If it is implemented for a specific operating unit or activity, policies and procedures developed by other parts of the organization can be used to meet the requirements of an environmental management system, provided that they are applicable to the specific operating unit or activity that will be subject to the environmental management system. The level of detail and complexity of the environmental management system, the extent of documentation and resources dedicated to it will be dependent on the size of the organization and the nature of its activities. This may be the case in particular for small and medium-sized enterprises.

Integration of environmental matters with the overall management system can contribute to the effective implementation of the environmental management system, as well as to the efficiency and clarity of roles.

In many aspects, the ISO 14001 standard shares common management system principles with the ISO 9000 series of quality system standards. In the beginning of the ISO 14001 standard, it states that "organizations may elect to use an existing management system consistent with the ISO 9000 series as a basis for its environmental management system. It should be understood, however, that the application of various elements of the management system may differ due to different purposes and different interested parties. While quality management systems deal with customer needs, environmental management systems address the needs of a broad range of interested parties and the evolving needs of society for environmental protection."

Related standards under development

The ISO 14000 family of standards also includes other draft standards related to environmental management systems that will soon be available for trial. These include standards on environmental auditing and related environmental investigations, environmental labeling, environmental performance evaluation, life-cycle assessment, terms and definitions and environmental aspects in product standards.

HOW TO USE THIS CHECKLIST

On the following pages are a series of questions to identify to what extent your environmental management system is complete in comparison to the requirements set in the ISO 14001 standard.

To facilitate answering the questions, there is a table beneath each question with three columns of examples. Each column corresponds to a score. The examples in the first column illustrate a situation which does not comply at all with the requirement and has the score "0". The examples in the second column illustrate a situation where the requirement is more or less fulfilled, but where there is still room for improvement and a score "1" applies. Finally in the third column, the examples illustrate a situation in which the requirement appears to be completely fulfilled and a score "2" applies.

How to Score

It is possible to calculate a score by using one of two methods. In the first method, you should begin with the first column to determine if the situation described therein accurately reflects the situation in your organization or facility. If not, then proceed to the second column and make the same decision. Eventually, move on to the third column and ask the same questions. In this way, you "build" progressively on your score.

0	1	2
Verify whether one of the paragraphs in this box is applicable to the situation in your organization. ➢ If this is the case, your score for this question will be "0". ➢ If this is not the case, proceed in next column.	Verify whether any of the statements in this box is applicable to the situation in your organization. ➢ If this is the case, your score for this question will be at least "1". ➢ Proceed to the next column, to verify whether your score is even better or to identify the areas where you could improve your environmental management system.	Verify whether your organization conforms with ***all*** the paragraphs in this box. ➢ If this is the case, your score for this question will be "2". Congratulations, you successfully implemented this aspect of the environmental management system. ➢ If this is not the case, your score remains "1". You have identified an area where your environmental management system can be improved.
Comments: Note your comments here on a) the adequacy and comprehensiveness of the management system elements currently in place and b) management system elements lacking or requiring improvement that the organization will require for ISO 14001 certification.		Score: _____

Write your score in the space provided, and note any comments or observations in the appropriate space (e.g., any actions to be taken to improve situation or score.) Alternatively, a process of elimination can be used. In this case, begin with the third column and determine whether all or some of the situations described apply to your organization. If all statements apply, give your organization a "2". If none, or only some, of the statements apply, move then to the middle column. If any of these statements apply to your organization, then assign a score of "1". If none of these statements apply, then assign a score of "0".

EVALUATION OF YOUR FINAL SCORE

This checklist contains a total of 31 questions in five different sections, corresponding to the five guiding principles listed in the ISO 14004 standard. A perfect score of "62" (i.e., every question received a score of 2) would, if responded to thoroughly and honestly, indicate that the organization has all of the requisite EMS elements and procedures called for in the draft standard, sufficiently implemented to adhere to the standard.

A score of "0" would likely seldom, if ever, occur, since even the most rudimentary elements of mere legal compliance would normally oblige the use of a minimum of management practices. It is important to bear in mind that how well an organization implements the standard's requirements is not the level of performance achieved using the standard, but the completeness and adequacy of the procedures and systems established to achieve that performance. Thus, for example, the mere fact that all employees are currently aware of their environmental responsibilities is insufficient under the terms of the standard. This could actually be a "chance" situation in the absence of defined and documented procedures to ensure that all employees (current and future) are made aware of these responsibilities.

For ease of interpreting scores, we have broken down the standard into its principle elements and have established a rating system based on three ranges of possible score for each, as follows.

Principle 1: Commitment and Policy

Score 0-5	The organization either has no environmental policy, or its policy lacks most of the key elements, such as a commitment to continual improvement, required to fulfill the terms of the standard.
Score 6-10	The organization has an environmental policy that meets many, but not all, of the requirements established under the standard.
Score 11-14	Top management has established and documented an environmental policy that meets most, if not all of the criteria laid down in the standard. This policy takes into account most, if not all, of the environmental aspects and is well communicated, both inside and outside of the organization. However, if the policy is not appropriate to the nature, scale and environmental impacts of the organization's activities, products or services, subsequent development of the EMS might be compromised.

Principle 2: Planning

Score 0-3	The organization has focused little, if any effort on identifying its relevant environmental aspects and setting achievable objectives and targets; its environmental management program is insufficient to implement the environmental policy.
Score 3-6	The organization has made progress in identifying most of its environmental aspects as well as the legal requirement to which it is subject, and might have established some objectives and targets which its environmental management program is designed to achieve, but much progress is still required.
Score 6-10	Most, if not all, of the required procedures exist to identify how its activities, products and/or services impact the environment, and to keep up to date on changing regulations. Measurable targets and objectives have been set for most, if not all appropriate levels of the organization; an action program exists to ensure their attainment. On the other hand, if clear, documented targets and objectives have not been established on the basis of a fairly complete identification of all environmental aspects of the business, its environmental action program may well overlook certain key issues of concern.

Principle 3: Implementation and Operation

Score 1-8 — Existing procedures do not fully take into account all environmental aspects at all levels and activities of the organization. Specific responsibilities and accountabilities might not be sufficiently communicated throughout the organization. Sufficient resources and technical competencies might yet be lacking.

Score 9-18 — Many procedures to achieve the policy's objectives and targets exist, but they might not include emergency situations. Responsibilities and accountabilities for their implementation have been assigned for the most part, and much, but not all of the needed resources requirements have been made available.

Score 19-26 — Most, if not all, areas of responsibility have been assigned, and resources allocated. Operating and other procedures have been developed, documented and communicated. Personnel are trained in their use and in complying with their environmental responsibilities. Document controls exist to ensure that systems are kept up to date. But, if operations and activities associated with or causing significant environmental aspects have not been identified (see Principle 2) or if documented procedures have not been established to ensure that they are performed in accordance with the environmental policy, implementation will not meet the terms of this standard

Principle 4: Measurement and Evaluation

Score 1-3 — Few, if any procedures have been developed or implemented for checking the performance of the EMS and its component elements; and thus, areas of non-conformance cannot be adequately identified; as a result, corrective or preventive measures cannot be effectively taken.

Score 4-7 — The organization has established many of the measurement and evaluation procedures required by the standard, and might have some of the key elements for dealing with situations of non-conformity. Some important records are maintained, and EMS audits might be carried out. However, much improvement is still warranted to conform to the standard.

Score 8-10 — The organization has implemented the majority of procedures and programs described in the standard to effectively and regularly monitor and measure the applicable characteristics of operations and activities, as well as to detect and correct areas of non-conformity. Adequate procedures exist for management of most, if not all, appropriate records, and a regular EMS audit program has been established. Even with a high score, however, the overall performance in meeting these criteria will be placed in serious doubt if the organization does not have a program and documented procedures for periodic audits of the EMS, which are adequate to ensure that conformity with policies, objectives and targets is indeed systematic, and not accidental

Principle 5: Review and Improvement

Since there is only one question in this section, your score for the question posed will give an adequate indication of your score for the section. In any event, the organization cannot substantively fulfill this requirement if it does not periodically review the basic assumptions upon which its EMS is based.

Overall Score

A high score in any section is not necessarily a sign that the requirement is essentially met, if the core key criteria in that section is not met. Moreover, because all principles and elements are closely interlinked, a low score in any given section could place in doubt the higher scores achieved elsewhere. On the other hand, scoring at least 1 or 2 in each question should give the organization the confidence that its management approaches are compatible with the EMS as described in ISO 14001.

4.1 Environmental Policy

Principle 1: Commitment and Policy

"The environmental policy is the driver for implementing and improving the organization's environmental management system."

4.1 HAS TOP MANAGEMENT DEFINED THE ORGANIZATION'S ENVIRONMENTAL POLICY?

0	1	2
Top management has not defined an environmental policy yet.	An environmental policy was issued, but it is not clear that it was defined and endorsed by top management. The environmental policy has not been defined within the context of the environmental policy of the broader corporate body (if any) of which the organization is a part, and has not received the endorsement of that body (*see Annex A to the Standard, A.4.1*).	Top management has defined the organization's environmental policy in a written document and made it public. The environmental policy has been defined and documented within the context of the environmental policy of the broader corporate body (e.g., the parent company or other overall organization, if any) and has the endorsement of that body (*see Annex A to the Standard, A.4.1*).
Comments: Score: _____		

4.1.A IS THIS ENVIRONMENTAL POLICY APPROPRIATE TO THE NATURE, SCALE AND ENVIRONMENTAL IMPACTS OF ITS ACTIVITIES, PRODUCTS OR SERVICES?

0	1	2
The environmental policy was not developed with a view to the nature, scale or impacts of activities, products or services.	The organization has an environmental policy which partially reflects the nature, scale and environmental impacts of its activities, products or services. The policy reflects broadly the nature, scale and environmental impacts of the organization's activities or products or services, but not all three.	The organization has consciously examined the nature and scale of its activities, products and services. The policy is periodically reviewed and revised to reflect changing conditions and information concerning the nature, scale and environmental impacts of its activities, products and services. The areas of application of the policy are clearly identifiable (*see Annex A to the Standard, A.4.1*).

Comments:

Score: _____

4.1.B DOES THE ENVIRONMENTAL POLICY INCLUDE A COMMITMENT TO CONTINUAL IMPROVEMENT AND PREVENTION OF POLLUTION?

0	1	2
The environmental policy does not include a clear commitment to continual improvement and prevention of pollution.	The environmental policy does not commit to both continual improvement and prevention of pollution, but only commits to one of these.	The environmental policy contains a clear commitment to pursue continual improvement in environmental performance by putting in place an effective environmental management system. The policy commits to the prevention of pollution.

Comments:

Score: _____

4.1.c DOES THE ENVIRONMENTAL POLICY INCLUDE A COMMITMENT TO COMPLY WITH RELEVANT ENVIRONMENTAL LEGISLATION AND REGULATIONS, AND TO OTHER REQUIREMENTS TO WHICH THE ORGANIZATION SUBSCRIBES ?

0	1	2
The environmental policy does not include a commitment to comply with relevant environmental legislation and regulations, or to other requirements to which the organization subscribes.	The environmental policy includes a commitment to comply with relevant environmental legislation and regulations, but does not mention any commitment to any other requirements to which the organization subscribes. The policy includes a commitment to adhere to or comply with other requirements to which the organization subscribes (e.g. "Responsible Care") but does not explicitly commit the organization to comply with relevant legislation.	The environmental policy includes a clear commitment to comply with relevant environmental legislation and regulations, as well as to all other requirements to which the organization subscribes (such as the ICC Business Charter for Sustainable Development, for example).

Comments:

Score: _____

4.1.D DOES THE ENVIRONMENTAL POLICY PROVIDE THE FRAMEWORK FOR SETTING AND REVIEWING OF ENVIRONMENTAL OBJECTIVES AND TARGETS?

0	1	2
The environmental policy is not specific enough to guide the setting of environmental objectives and targets. The policy has been written in such a way that may leave its readers confused as to its overall goals and objectives. The policy does not specify any commitments.	The environmental policy is specific enough to guide the setting of environmental objectives and targets in many of the environmental aspects of relevance to the organization. It does not, however, provide sufficient guidance with regard to all key environmental aspects. Overall, the environmental policy is sufficiently clear as to be capable of being understood by most interested parties, but there are some portions that might be misunderstood or which have caused confusion.	The environmental policy is clear and specific enough to guide the setting of environmental objectives and targets. The policy is sufficiently clear to be capable of being understood by interested parties, including those responsible for reviewing environmental targets and objectives.
Comments: Score: _____		

4.1.E IS THE ENVIRONMENTAL POLICY DOCUMENTED, IMPLEMENTED AND MAINTAINED, AND COMMUNICATED TO ALL EMPLOYEES ?

0	1	2
The environmental policy has not been documented (i.e., in written or electronic form) or communicated to all employees. No provisions have been made by management for the maintenance or implementation of the environmental policy (e.g., top management have not designated a specific management representative with defined responsibility and authority for implementing the environmental management system of which the policy forms a part).	The environmental policy has been documented, but it has not been communicated to all employees (e.g. there is no procedure to ensure that new employees receive a copy of the environmental policy). There is no procedure to ensure the environmental policy is regularly reviewed and adapted to the changed perceptions and circumstances (i.e., maintained).	The environmental policy has been documented and it is communicated to all employees. All new employees receive a copy of the environmental policy. The environmental policy is regularly reviewed and adapted to the changed perceptions and circumstances.

Comments:

Score: _____

4.1.F IS THE ENVIRONMENTAL POLICY AVAILABLE TO THE PUBLIC?

0	1	2
The environmental policy is not made available to the public.	The environmental policy is made available to some members of the public (provided, for example, the public affairs or legal department approve its dissemination).	The environmental policy is freely available to any member of the public who requests it. Any amendments or modifications to the policy are also made available to the public.

Comments:

Score: _____

4.2 Planning

Principle 2: Planning

"An organization should formulate a plan to fulfill its environmental policy."

4.2.1.A. Is there a procedure to identify the environmental aspects of your business over which you have control or influence and to determine actual or potential significant impacts on the environment?

0	1	2
There is no procedure to identify the environmental aspects of the business.	There is a procedure to identify the environmental aspects of the activities, products or services over which the organization has control or influence, but not all three. Existing procedures are insufficient to determine which environmental aspects have or can have a significant impact on the environment (Note: information already developed for regulatory or other purposes may be used in this process). If the organization does not have an existing environmental management system, it has not conducted a review to establish its current position with regard to the environment (*see Annex A to the Standard, A.4.2.1*). The organization does not keep information regarding its environmental aspects up to date.	There is a procedure to identify the significant environmental aspects of the business, including activities, products and services and it has been determined which of the environmental aspects of the business have or can have a significant impact on the environment. If the organization did not have an existing environmental management system, its first step in this process was to establish its current position with regard to the environment by means of a review (*see Annex A to the Standard, A.4.2.1*). The process for identifying significant environmental aspects takes into account the cost and time of undertaking the analysis and the availability of reliable data (*see Annex A to the Standard, A.4.2.1*). The analysis of significant environmental aspects of the organization takes into account the inputs and outputs associated with its current and relevant past activities, products and services (*see Annex A to the Standard, A.4.2.1*). The information is kept up to date.
Comments: Score: _____		

4.2.1.B. ARE ASPECTS RELATED TO THESE SIGNIFICANT IMPACTS CONSIDERED IN SETTING ENVIRONMENTAL OBJECTIVES?

0	1	2
The process of setting environmental objectives was not, or does not, take aspects related to significant environmental impacts into consideration.	The process of setting environmental objectives has taken or takes into consideration aspects related to significant environmental impacts for activities or products or services, but not all three. (Note: the organization may take into account the degree of practical control it may have over the environmental aspects being considered).	The process of setting environmental objectives has taken or takes into consideration aspects related to significant environmental impacts related to its activities, products and services.

Comments:

Score: _____

4.2.2 DO YOU HAVE A PROCEDURE TO IDENTIFY AND HAVE ACCESS TO LEGAL REQUIREMENTS APPLICABLE TO THE ENVIRONMENTAL ASPECTS OF YOUR ACTIVITIES, PRODUCTS OR SERVICES ?

0	1	2
There is no documentation on environmental legislation and regulations applicable to the organization, nor of the other environmental requirements to which the organization subscribes. No procedure exists to ensure that the organization will identify and access all new and modified legal or other requirements applicable to activities, products or services.	There is a procedure to identify all legal requirements that are applicable to the environmental aspects of the organization's activities or products or services, but not all three Procedures exist to identify and access most legal and other requirements, but not all. Procedures exist to identify, access and update information relative to the non-regulatory environmental programs to which the organization subscribes, but not the legal requirements.	There is a procedure to systematically identify all new legal requirements that apply to the environmental aspects of the organization's activities, products or services. The procedure also systematically identifies modifications to existing legal and other requirements. The procedure ensures access to all existing, new and modified legal requirements. The procedure also ensures identification, access and updating of other, non-regulatory requirements to which the organization subscribes.

Comments:

Score: _____

4.2.3 HAVE ENVIRONMENTAL OBJECTIVES AND TARGETS BEEN ESTABLISHED AND DOCUMENTED AND ARE THERE PROCEDURES FOR MAINTAINING THESE DOCUMENTS?

0	1	2
No environmental objectives and targets have been established by the organization. No environmental policy has been established.	Environmental objectives and targets have been established by the organization, but not documented. The environmental objectives and targets were not established with consideration of legal or other requirements, significant environmental aspects, technological options, or interested parties. No procedure exists to ensure that these objectives and targets are reviewed and maintained regularly. Environmental objectives and targets have been established and documented but do not cover each and every relevant function and level within the organization. Targets and objectives include consideration of end-of-pipe technological options and compliance with legal and other requirements, but do not reflect a commitment to pollution prevention. Targets and objectives take into consideration the organizations' financial, operational and business requirements but not the views of interested parties.	Environmental objectives and targets have been developed at each relevant function and level within the organization. The objectives are specific and the targets are measurable wherever practicable. The objectives and targets are consistent with the environmental policy and reflect a commitment to pollution prevention. The objectives and targets are in alignment with the significant environmental impacts associated with the organization's activities, products or services. The organization has taken into consideration, when establishing (and reviewing) its objectives, legal and other requirements, technological options, financial, operational and business requirements, as well as the views of interested parties. There is a procedure to ensure the objectives and targets are reviewed and updated regularly.
Comments: Score: _____		

4.2.4 HAS AN ENVIRONMENTAL MANAGEMENT PROGRAM FOR ACHIEVING THE OBJECTIVES AND TARGETS BEEN ESTABLISHED AND MAINTAINED?

0	1	2
No environmental management program has been developed.	In view of achieving the environmental objectives and targets, an environmental management program has been developed, including management procedures for some relevant functions and levels of the organization, but not for all. The environmental management program does not stipulate the means or timeframe for achieving its objectives and targets. A program was established, but has not kept pace with new developments or products in the organization.	The organization has established an environmental management program for achieving its objectives and targets, which describes how the organization's targets will be achieved (*see Annex A to the Standard, A.4.2.4*). The program identifies the personnel responsible for implementing the environmental policy and who is responsible for achieving the objectives and targets at each relevant function and level within the organization. The program includes the means available (e.g. financial, physical or human resources) by which the organization shall achieve its objectives and targets. The program has a clear timeframe which identifies what will be done or achieved by when and how. The environmental management program is amended where relevant to ensure that environmental management will be applied to new developments and new or modified activities, products or services. The environmental management program includes environmental reviews for new activities (*see Annex A to the Standard, A.4.2.4*).
Comments: Score: _____		

4.3 Implementation and Operation

Principle 3: Implementation

"For effective implementation an organization should develop the capabilities and support mechanisms necessary to achieve its environmental policy, objectives and targets."

4.3.1.1 HAVE ROLES, RESPONSIBILITY AND AUTHORITIES BEEN DEFINED, DOCUMENTED AND COMMUNICATED ?

0	1	2
Top management have not appointed (a) specific environmental management representative(s).	Top management have appointed (a) specific environmental management representative(s) but the roles, responsibilities and authority of this individual (these individuals) have not been defined or documented. Roles, responsibilities, and authorities of other operational management and staff functions for implementing the various elements of the environmental management system have been defined but have not been documented. The roles, responsibilities, and authorities of other operational management and staff functions have not been communicated to personnel.	Top management have appointed (a) specific environmental management representative(s). The representative(s) has a defined role, responsibility and authority for ensuring that the requirements of the environmental management system are established, implemented and maintained in accordance with the ISO 14001 standard and for reporting performance of the environmental management system to top management. Roles, responsibilities, and authorities of other operational management and staff functions for implementing the various elements of the environmental management system have been defined, documented and communicated to personnel in order to facilitate management. The environmental management representative reports on the performance of the environmental management system to top management. These reports are used by top management to review the environmental management system and the basis for its improvement.
Comments: Score: _____		

4.3.1.2 DOES MANAGEMENT PROVIDE THE RESOURCES ESSENTIAL TO THE IMPLEMENTATION AND CONTROL OF THE ENVIRONMENTAL MANAGEMENT SYSTEM ?

0	1	2
Management has not identified the resources essential to the implementation and control of the environmental management system. Resources may include human resources, specialized skills, technology, equipment, and financial resources but specialized skills are lacking.	Management has identified some of the resources essential to the implementation and control of the environmental management system, but specialized skills are lacking (i.e., technology, equipment, and financial resources). Management has allocated some of the essential resources, such as human but not financial.	Management has identified the resources essential to the implementation and control of the environmental management system. Management provides all the resources essential to the implementation and control of the environmental management system.
Comments: Score: _____		

4.3.2.1 HAVE ALL TRAINING NEEDS BEEN IDENTIFIED ?

0	1	2
No procedures have been established to identify training needs. Training needs have not been identified.	Procedures have been established to identify training needs. None or only some of the concerned personnel have received training. Procedures have not been established to ensure that contractors working on the organization's behalf are able to demonstrate that their employees have the requisite training.	Procedures have been established to identify training needs (see A.4.3.2) Procedures have been developed to ensure that all personnel whose work may create a significant impact upon the environment, has received appropriate environmental training. The procedures also require that contractors working on the organization's behalf are able to demonstrate that their employees have the requisite training. A system has been established to periodically review the procedures used to identify training needs and ensure that proper training is provided.
Comments: Score: _____		

4.3.2.2 HAVE PROCEDURES BEEN ESTABLISHED TO MAKE EMPLOYEES OR MEMBERS AT EACH RELEVANT FUNCTION AND LEVEL AWARE OF ENVIRONMENTAL ISSUES ?

0	1	2
No procedures have been established to make personnel at each relevant function and level aware of environmental issues.	Procedures have not been established to ensure all personnel at each relevant function and level are aware of environmental issues. Only the personnel in certain departments have been made aware of environmental issues. Only the personnel in certain departments are made aware of the actual or potential significant environmental impacts of their work activities and the environmental benefits of improved personal performance. There is an overall awareness of environmental issues; however, not all personnel are made aware of the potential consequences of departure from specified operating procedures. Relevant training is provided, but no procedure exists for ensuring that all new employees receive appropriate training and awareness.	Procedures exist to ensure that all relevant personnel receive training to increase awareness of the importance of conformance with the requirements of the environmental management system. Procedures exist to ensure that all employees are made aware of the actual or potential significant environmental impacts of their work activities and the environmental benefits of improved personal performance. All employees are made aware of their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirements of the environmental management system, including emergency preparedness and response requirements. All employees are made aware of the potential consequences of departure from specified operating procedures.

Comments:

Score: _____

4.3.2.3 HAS IT BEEN ENSURED THAT PERSONNEL PERFORMING TASKS WHICH CAN CAUSE SIGNIFICANT ENVIRONMENTAL IMPACTS ARE COMPETENT ?

0	1	2
Appropriate educational, training or experience requirements have not been identified.	Management has determined the level of experience, competence and training necessary to ensure the capability of personnel, especially those carrying out specialized environmental management functions. Not all personnel performing the relevant tasks meet the minimum educational/training or experience requirements identified by management.	Management has determined the level of experience, competence and training necessary to ensure the capability of personnel, especially those carrying out specialized environmental management functions. It has been ensured that personnel performing tasks which may cause significant environmental impacts have the required competence. The level of required competence of such personnel has been determined on the basis of appropriate education, training and/or experience.

Comments:

Score: _____

4.3.3 HAVE APPROPRIATE PROCEDURES BEEN ESTABLISHED FOR INTERNAL AND EXTERNAL COMMUNICATIONS REGARDING THE ENVIRONMENTAL ASPECTS AND THE ENVIRONMENTAL MANAGEMENT SYSTEM ?

0	1	2
No procedures have been established for internal nor external communications regarding the environmental aspects and the environmental management system.	Some procedures have been established for internal communications between the various levels and functions of the organization, but not for external communication. Procedures have been established for receiving relevant communications from external interested parties, but there are no procedures to document or respond to communications with external parties. There are no procedures to periodically review the procedures used for internal and external communications. Procedures exist with regard to receiving, documenting and responding to external sources concerning the environmental management system, but not regarding its environmental aspects.	Procedures have been established for internal communications between the various levels and functions of the organization. Procedures have been established for receiving, documenting and responding to relevant communications from external interested parties on its environmental management system. The organization has considered the various possible processes for external communication on its significant environmental aspects and has recorded its decision in this regard. All these procedures are reviewed and adapted to changing circumstances and perceptions.
Comments: Score: _____		

4.3.4 IS THERE DOCUMENTATION WHICH DESCRIBES THE ENVIRONMENTAL MANAGEMENT SYSTEM ?

0	1	2
The core elements of the environmental management system have not been described and documented.	The core elements of the environmental management system have been identified, described and documented but the interaction or relationships between the different elements is not documented. This documentation does not provide direction on where to find or classify related environmental documentation.	The core elements of the environmental management system have been identified, described and documented. The interactions between the core elements of the environmental management system have been described. These descriptions have been documented in paper or electronic form. This documentation provides direction on where to find or classify related environmental documentation.
Comments: Score: _____		

4.3.5.1 HAVE PROPER DOCUMENT CONTROL PROCEDURES BEEN ESTABLISHED ?

0	1	2
Management has not identified documents that must be maintained and controlled. There are no procedures for controlling and maintaining documents.	Management has identified the documents required by ISO 14001 that must be maintained and controlled. Certain document control procedures have been established. It has not been determined who is responsible or authorized for the creation and modification of the various types of documents. There is no system in place for the documents to be periodically reviewed and revised. No defined procedures exits to ensure that the current versions of relevant documents are not available at all locations where operations essential to the effective functioning of the system are performed.	Management have established and maintain procedures for controlling all documents required by ISO 14001 in order to ensure that they can be located. Procedures exist to ensure that all documentation is periodically reviewed and revised as necessary, and approved for adequacy by authorized personnel. Procedures exist to ensure that current, legible versions of relevant documents are available at all locations where operations essential to the effective functioning of the system are performed. Procedures exist to ensure that obsolete documents are promptly removed from all points of issue and all points of use, or otherwise assured against unintended use. Procedures exist to ensure that any obsolete documents retained for legal and/or knowledge preservation purposes are suitably identified.
Comments: Score: _____		

4.3.5.2 ARE ALL DOCUMENTS IN A PROPER STATE AND FORMAT ?

0	1	2
Available documents are barely legible if at all (e.g., copies of copies, fax documents that are unclear, etc.) Available documents are not (or not all) dated to indicate originals or revisions. No procedures or responsibilities have been established governing the creation or revision of environmental management system documents.	All documentation is legible and readily identifiable. All documents are dated, with dates of revision. Different formats for like documents exist; and, documents are not readily identifiable. Obsolete, outdated documents are not discarded.	All documentation is legible. All documents are dated, with dates of revision. All documents are readily identifiable. All documents are maintained in an orderly manner. All documents are maintained for a period specified in the documents. Clear instructions are provided for document maintenance, including updating or replacement with revisions and the proper disposition of obsolete documents.
Comments: Score: ____ _____		

4.3.6.1 HAVE THOSE OPERATIONS AND ACTIVITIES ASSOCIATED WITH THE SIGNIFICANT ENVIRONMENTAL ASPECTS BEEN IDENTIFIED?

0	1	2
Management has not identified the operations and activities that may cause significant environmental impacts. The organization has not defined a policy or objectives and targets.	Management has identified some or all of those operations and activities that may cause significant environmental impacts but has not documented these situations where the absence of documented procedures could lead to non-compliance with the policy or deviations from the objectives and targets have not been identified.	The operations and activities that are related to the significant environmental aspects of the organization have been identified and documented. Situations requiring documented procedures to ensure compliance with policy and attainment of objectives and targets have been identified.
Comments: Score: _____		

4.3.6.2 HAVE SUCH OPERATIONS AND ACTIVITIES BEEN PLANNED IN SUCH A WAY AS TO ENSURE THEY ARE CARRIED OUT UNDER SPECIFIED CONDITIONS?

0	1	2
Procedures have not been established for any of the operations and activities associated with the identified significant environmental aspects in line with its policy, objectives and targets.	Procedures have been established for most, but not all of the operations and activities associated with the identified significant environmental aspects in line with its policy, objectives and targets. Procedures are not periodically reviewed. Procedures are not communicated to suppliers and contractors. Operating criteria is not stipulated in the procedures.	Documented procedures have been established for all the operations and activities, including maintenance. Operating criteria have been stipulated in these procedures (e.g. one is allowed to proceed with air emissions from a production process, if certain threshold limits are not exceeded). Documented procedures have been established for goods and services used by the organization that are related to the significant environmental aspects. Relevant procedures are communicated to suppliers and contractors. All procedures are reviewed periodically and adapted when necessary.
Comments: Score: _____		

4.3.7.1 HAVE PROPER PROCEDURES BEEN ESTABLISHED TO IDENTIFY THE POTENTIAL FOR AND TO RESPOND TO ACCIDENTS AND EMERGENCY SITUATIONS ?

0	1	2
There are no procedures in place to identify the potential for or to respond to accidents and emergency situations.	Procedures have been established to identify the potential for environmental incidents, accidents and emergency situations. Procedures have not been defined for emergency response in all identified potential situations. There is no system to periodically review and revise the procedures. Procedures have not been defined for proactively preventing emergencies in identified potential situations or for mitigating environmental impacts associated with such emergencies (e.g., fire response procedures do not include spill prevention, control or countermeasure procedures).	Procedures have been established to identify the potential for and to respond to environmental incidents, accidents and emergency situations. The procedures also focus on preventing and mitigating the environmental impacts that may be associated with accidents or emergency situations. After the occurrence of accidents or emergency situations, the procedures are reviewed and where necessary revised to prevent re-occurrence.
Comments: Score: _____		

4.3.7.2 ARE SUCH PROCEDURES PERIODICALLY TESTED AND REVIEWED / REVISED AFTER TESTS OR AFTER ACTUAL INCIDENTS? SITUATIONS ?

0	1	2
No tests have ever been carried out of the emergency response procedures.	One or two tests have been carried out of certain procedures, but tests are not regularly (i.e., periodically) carried out. No procedure exists for investigating accidents or incidents with a view to revising emergency response procedures as appropriate.	Tests of emergency response procedures are regularly (i.e., periodically) carried out. Specific procedures have been established and implemented for the review of performance of such tests and their efficiency in the situations for which they are designed. Specific procedures exist and are implemented for the systematic investigation of all accidents and incidents impacting the environment and foresee steps to appropriate revision/corrective measures.
Comments: Score: _____		

4.4 Checking and Corrective Action

Principle 4: Measurement and Evaluation *"An organization should measure, monitor and evaluate its environmental performance."*

4.4.1.1 HAVE PROCEDURES BEEN ESTABLISHED FOR MONITORING AND MEASURING ON A REGULAR BASIS THE KEY CHARACTERISTICS OF THE OPERATIONS AND ACTIVITIES THAT CAN HAVE A SIGNIFICANT ENVIRONMENTAL IMPACT ?

0	1	2
There are no procedures to monitor the key characteristics (e.g., quantity and characteristics of effluent discharges, air emissions, solid and hazardous waste; water, energy use; quantity of waste per unit of product produced, etc.) of the operations and activities that can have a significant environmental impact. Required monitoring equipment is not controlled to ensure proper calibration and maintenance. No procedures exist to verify compliance with relevant environmental legislation and regulations.	Procedures have been established for monitoring on a regular basis some of the key characteristics of the operations and activities that can have a significant environmental impact. Procedures for either of the above have not been documented. There is no system in place to periodically review these procedures. The results of such monitoring are not documented or recorded.	Procedures have been established for monitoring on a regular basis the key characteristics of the operations and activities that can have a significant environmental impact. The procedures require the recording of information to track performance, relevant operational controls and conformance with the organization's objectives and targets. These procedures have been documented and are reviewed regularly. Monitoring equipment has been calibrated and is maintained. The records of this process are retained according to the organization's procedures.
Comments: Score: _____		

4.4.1.2 ARE THERE ESTABLISHED DOCUMENTED PROCEDURES FOR THE PERIODIC EVALUATION OF COMPLIANCE WITH RELEVANT ENVIRONMENTAL LEGISLATION AND REGULATIONS?

0	1	2
No procedures exist for evaluating regulatory compliance.	Some procedures exist for evaluating compliance with relevant regulatory requirements but they either: • do not include a detailed evaluation of all requirements, or • do not cover all aspects of operations, products and services. Such evaluations are not conducted regularly or periodically.	Specific procedures have been established and are documented to evaluate regulatory compliance of all activities, products or services. Procedures include measures to identify and document the relevant regulatory requirements with which such activities, products or services must comply. Procedures establish the periodicity with which such evaluations must be conducted. Results of such evaluations are documented and reported to management.
Comments: Score: _____		

4.4.2 HAVE PROCEDURES BEEN ESTABLISHED FOR DEFINING RESPONSIBILITY AND AUTHORITY FOR HANDLING NON-CONFORMANCE AND THE TAKING OF CORRECTIVE AND PREVENTIVE ACTION?

0	1	2
Management has not established procedures for defining responsibility and authority for handling potential non-conformance and taking corrective actions. Incidences of non-conformance are not investigated to determine corrective or preventive actions.	Procedures have been established for defining responsibility and authority for handling and investigating non-conformance and taking corrective action. These procedures are not updated in light of experience with actual situations of non-conformity. Corrective or preventive actions are often "stop-gap" measures that do not fully reflect the magnitude of the problem or are not fully commensurate with the environmental impact encountered. The written operating procedures are not updated to record/reflect "lessons learned" from previous non-conformance.	Procedures have been established and documented for defining responsibility and authority for handling and investigating incidences of non-conformance. Procedures have been established and documented for defining responsibility and authority for taking action to mitigate any impacts caused by non-conformance and for initiating and completing corrective and preventive action. Corrective or preventive measures taken to eliminate the causes of actual and potential non-conformance are always appropriate to the magnitude of problems and commensurate with the environmental impact encountered. Any changes in the written operating procedures resulting from corrective and preventive action have been implemented and recorded.

Comments:

Score: _____

4.4.3 HAVE PROCEDURES FOR THE IDENTIFICATION, MAINTENANCE AND DISPOSITION OF ENVIRONMENTAL RECORDS BEEN ESTABLISHED AND MAINTAINED ?

0	1	2
There are no procedures for the identification, maintenance and/or disposition of environmental records.	Procedures for the identification, maintenance and disposition of some environmental records have been established. Certain environmental records are stored and maintained in such a way that they are readily retrievable and protected against damage, deterioration or loss. Retention times are not always established or recorded. Not all records relative to conformance to this standard are maintained.	Procedures for the identification, maintenance and disposition of environmental records have been established and are maintained. The environmental records among others including training records and the results of audits and reviews, as well as the extent to which planned objectives and targets have been met (*see Annex A to the Standard, A.4.4.3*). These environmental records are legible, identifiable and traceable to the activity, product or service involved. Environmental records are stored and maintained in such a way that they are readily retrievable and protected against damage, deterioration or loss. The retention times of the various environmental records are established and recorded. All records required to demonstrate conformity to this standard (including regulatory compliance) are maintained.
Comments: Score: _____		

4.4.4 DOES THE ORGANIZATION HAVE (A) PROGRAM(S) AND PROCEDURES FOR PERIODIC ENVIRONMENTAL MANAGEMENT SYSTEM AUDITS ?

0	1	2
No audit procedures have been established. Audit procedures do not include an evaluation of the environmental management system (e.g., audits concentrate only on compliance with regulatory requirements).	A program and procedures for periodic environmental management system audits have been established. The audits are aimed at determining whether or not the environmental management system has been properly implemented and maintained and whether the environmental management system conforms to planned arrangements. However, the periodicity of these audits or the audit program overall does not reflect the related potential environmental importance of the activity concerned, or does not take into account previous audits (if any). Audit procedures are not fully comprehensive (e.g., they do not cover all of the following: scope, frequency and methodologies, responsibilities and requirements for conducting audits and reporting results). The procedures do not ensure that information on the results of the audits is provided to management.	A program and procedures for periodic environmental management audits have been established. The audit program is aimed at determining whether or not the environmental management system conforms to planned arrangements for environmental management and whether or not the environmental management system has been properly implemented and maintained. The procedures ensure that information on the results of the audits is provided to management. The audit program, including frequency audits, is based on the environmental importance of the activity concerned and the results of previous audits. The audit procedures cover the scope of the audit, frequency and methodologies, required auditor competencies as well as the responsibilities associated with managing and conducting audits, and requirements for conducting audits and reporting results.
Comments: Score: _____		

4.5 Management Review

Principle 5: Review and Improvement *"An organization should review and continually improve its environmental management system, with the objective of improving its overall environmental performance."*

4.5 HAS TOP MANAGEMENT REVIEWED THE ENVIRONMENTAL MANAGEMENT SYSTEM?

0	1	2
No arrangements exist to ensure that top management reviews the environmental management system to ensure continuing suitability, adequacy and effectiveness.	Top management has plans and arrangements to review the environmental management system to ensure continuing suitability, adequacy and effectiveness. Such reviews are not documented. There is no schedule for periodically reviewing the environmental management system. The management review process is not adequate to ensure that the necessary information is collected to allow it to carry out the evaluation. Management's review addresses the elements necessary for environmental management system implementation and the procedures associated with its implementation, but does not address possible needs to change the policy or its objectives and targets.	Top management has reviewed the environmental management system to ensure continuing suitability, adequacy and effectiveness. As part of the review process, the necessary information is identified and collected to allow management to carry out this evaluation. Top management has determined the intervals at which it will review the environmental management system. The management review addresses changing circumstances that might necessitate the possible needs for changes to policy, objectives and other elements of the environmental management system, in the light of environmental management system audit results, changing circumstances and the commitment to continual improvement. Management's review is documented. The review of the policy, objectives and procedures is carried out by the level of management that defined them (*see Annex A to the Standard, A.4.5*).
Comments: Score: _____		

Annex I: Further Information

The following information is offered as further guidance for the development, implementation and checking of an organization's environmental management system. This information is derived primarily from the annex to ISO/DIS 14001 and from ISO/DIS 14004 - *Environmental management systems - General guidelines on principles, systems and supporting techniques.* Certain examples and hypothetical cases have been provided to illustrate the practical applications or implications of the principles elaborated in ISO/DIS 14004. These have been derived from various sources, including several commercially available information and training programs on EMS development and implementation, such as the "Environmental Management Systems Training Program" (*Opleiding in Milieubeheersystemen*) of the Federation of Belgian Enterprises and the "Environmental Management Systems Training Resource Kit" sponsored by the United Nations Environment Programme (UNEP), the International Chamber of Commerce (ICC) and International Federation of Consulting Engineers (FIDIC), both of which are based extensively on ISO/DIS 14001. Readers should bear in mind that the following information goes beyond a strict interpretation of the ISO standard and is intended to provide supplemental information and ideas on how an organization might satisfy the standard's requirements. It is not, and is not intended to be, an interpretation of the standard itself, and does not have the endorsement of ISO.

PRINCIPLE 1: COMMITMENT AND POLICY

The environmental policy acts as the driving force for implementing and improving the organization's environmental management system so that it can maintain and potentially improve its environmental performance. Environmental policy is defined as a "statement by the organization of its intentions and principles in relation to its overall environmental performance which provides a framework for action and for the setting of its environmental objectives and targets." The environmental policy can have far-reaching business implications for the future direction of the enterprise. It should be integrated into the organization's overall business strategy and should also be compatible with other organizational policies such as quality, service, product stewardship or occupational health and safety. Once an environmental policy has been developed and published, the organization's environmental performance will be judged against it.

To ensure success, an early step in developing or improving an environmental management system is obtaining commitment from the *top* management of the organization to improve the environmental management of its activities, products or services. The ongoing commitment and leadership of the top management are crucial. The responsibility for developing the environmental policy should therefore rest with those at the very highest levels of the organization (e.g. Board of Directors) and it should be signed by the Chairman, Chief Executive or similar senior most manager as evidence of commitment. Top management may consist of an individual or group of individuals with executive responsibility for the organization.

Other levels of management will then be responsible for implementing the policy, but continuing support from the top of the organization will be needed during the further development of the environmental management system and for the organizational changes which will result from its implementation. To allow this, senior management should appoint someone from management to oversee the development and to implement the environmental policy. This person from management should also be provided the authority and means to do so.

An environmental policy establishes an overall sense of direction and sets the principles of action for an organization. It sets the overarching goal as to the level of overall environmental responsibility and performance required of the organization, against which all subsequent actions will be judged. It should reflect the organization's mission, vision, core values and guiding principles. It should also be based upon a full appreciation of the organization's environmental impacts and responsibilities.

Formulating the policy

The organization's management is responsible for providing input to the formulation and modification of the policy and for implementing the policy. Guiding principles such as the "Rio Declaration on Environment and Development" or the "Business Charter for Sustainable Development" can assist the organization in developing its policy. If the organization is part of any broader corporate body, top management should define and document its environmental policy within the context of the environmental policy of that broader corporate body of which it is a part and with the endorsement of that body. Other important sources of information for input into the environmental policy development process include the following:

- The organization's values and beliefs, such as (desired) relationship with its employees, the local community and the general public.
- The organization's business strategy and strategic plan: elements relating to the organization's (environmental) direction, opportunities and risks, medium and long term planning including internal and external limits and opportunities in capabilities and resources.
- Any existing statement on environmental aspects: mission statements, old policies, previous statements of commitment in internal/external reports.
- Other policies in existence such as occupational health and safety, or quality.
- The views of stakeholders (shareholders, employees) and other interested parties.
- Policy goals based on the initial environmental review.
- Legislation and regulations.
- Clear definition of the geographical and organizational scope of the policy: which facilities, departments, activities, services or products are to be covered by the environmental policy.
- General statements of environmental principles; e.g. from government, public bodies, industry associations, which are relevant to the organization.
- Examples of environmental policy statements from similar organizations.

The issues addressed in the policy depend on the nature of the organization. All activities, products or services can cause impacts on the environment. The environmental policy should recognize this. The organization's environmental policy cannot fully and adequately reflect the nature, scale and environmental impacts of its operations, products and/or services unless a conscious effort is made to assess these and their potential impacts on and/or implications for the environment. Therefore, some form of initial environmental review is an absolute necessity if the resulting policy will truly reflect the organization's sense of environmental responsibility (*See Section 4.2.1 Environmental Aspects*).

Taking into account the findings of such an initial review, the values and beliefs of the organization, its relationship with staff, neighbors, shareholders, customers and suppliers, regulators and other persons with an interest in how well the organization manages its environmental affairs, the organization will prepare and publicize its environmental policy, which will offer the broad environmental goals the organization intends to, or hopes to achieve.

An environmental management system is a dynamic tool. The environmental policy should direct the environmental management system to achieve improvements in overall environmental performance. The organization should begin where there is obvious benefit, for example, by focusing on regulatory compliance, by limiting sources of liability or by making more efficient use of materials.

As the organization grows in experience, and its environmental management system starts to take shape, procedures, programs and technologies can be put in place to further improve environmental performance. Then

as the environmental management system matures, environmental considerations can be integrated into all business decisions.

The environmental policy forms the basis upon which the organization sets its objectives and targets. It should provide guidance. In ISO 14001, it is required that the environmental policy should explicitly include a commitment to comply with environmental legislation and regulations, and to other requirements to which the organization subscribes. This is a clear guidance to all persons involved in the organization that its activities should be carried out in compliance with environmental legislation and regulation. To have the greatest effect, it might be useful to identify, in the policy, the other requirements to which the organization subscribes, such as the Chemical Manufacturers Association (CMA) or Chemical European Federation of Chemical Industry (CEFIC) "Responsible Care" initiative, or the ICC Business Charter for Sustainable Development, for example.

For public authorities in many countries, this clear commitment to compliance with environmental legislation and regulations in the frame of a certified environmental management system is an indication that the organization is taking environmental issues seriously. This will allow the public authorities to focus their attention on those companies who do not seem to take environmental issues seriously.

The policy forms the basis upon which the organization sets its objectives and targets. These will, in turn, be achieved through the implementation of the environmental management program. The objectives and targets should, like the policy, take account of the nature, scale and characteristics of the activities, products and services of the organization. Useful inputs for determining these objectives and targets might include a consideration of the current state and evolution of environmental legislation, private industry initiatives, the views of other interested parties (including perhaps even environmentalists and community leaders), as well as financial and other business considerations. Some organizations may start small, and initially go after objectives that bring immediate rewards at low cost (i.e., "low-hanging fruit"). Eventually, targets and objectives might include longer-term business or commercial opportunities.

The policy should be sufficiently clear to be capable of being understood by internal and external interested parties and should be periodically reviewed and revised to reflect changing conditions and information. Its area of application should be clearly identifiable.

In addition to compliance with environmental regulations, the policy can state commitments to:

- minimize any significant adverse environmental impacts of new developments through the use of integrated environmental management procedures and planning;
- development of environmental performance evaluation procedures and associated indicators;
- embody life cycle thinking;
- design products in such a way as to minimize their environmental impacts in production, use and disposal;
- prevent pollution, reduce waste and the consumption of resources (materials, fuel and energy), and commit to recovery and recycling, as opposed to disposal where feasible;
- education and training;
- sharing environmental experience;
- involvement of and communication with interested parties;
- work towards sustainable development; and
- encourage responsible environmental behavior by suppliers and contractors.

Publishing and distributing

It is important to ensure that the environmental policy becomes widely known and understood throughout the organization. The publishing and distribution of the environmental policy can provide an ideal opportunity for management to outline the underlying reasons for developing an environmental management system (for example in terms of business security, opportunities and risk reduction) and to explain to the staff how it will be implemented within the enterprise. This will help to encourage, at all levels, full commitment to achieving the environmental goals.

Internal presentation of the policy should precede the formal external publication. This will give staff the opportunity to familiarize themselves with the policy and to have questions answered. The publication of the policy will inevitably lead to questions from the staff such as "how will this affect my work". The opportunity to begin an ongoing dialogue with staff concerning environmental aspects should not be missed. Input and suggestions from staff towards meeting the policy objectives can provide the basis for motivating staff and encouraging their cooperation during the implementation stage of the environmental management system.

The publishing of the environmental policy is often the first public step into the environmental arena. Moreover, it can be an effective tool within the organization itself. It provides an ideal opportunity to explain to all of the staff the environmental direction of the organization and the reasons why this is necessary, to motivate them and encourage their involvement and cooperation.

As it is written for a wide audience, the style of the environmental policy should be concise. The information should be clearly formatted. It should be written in plain language that is accessible to and can be understood by all interested parties. The use of jargon, both environmental and technical, should be avoided.

There are many ways to publicize the environmental policy, largely depending on the size and resources of the enterprise. A brochure to give to interested parties, including the environmental authorities, members of the local community, etc. should be the minimum. Many companies also print their environmental policy in their annual (environmental) report, as well as post it prominently at the entrance to their facilities or offices. Of course, it is also possible to pay for commercial advertising if this is seen of benefit to the organization.

Review of the environmental policy

In most organizations, the environmental policy is a relatively long-lived document, remaining unchanged for two or three years or even longer. However, it is necessary to ensure the continuing suitability of the policy on a regular basis. Changes might be necessary as a result of, for example:

- changing market situation;
- changes in processes, products, etc.;
- a merger with or acquisition of another organization; and/or
- the views of public and stakeholders.

It is important to include the review of the policy in the overall management review of the environmental management system (*See Section 4.5 Management Review*) and to revise and adjust it as necessary.

PRINCIPLE 2: PLANNING

Identification of environmental aspects and impacts

An organization's policy, objectives and targets should be based on knowledge about the environmental aspects and significant environmental impacts associated with its activities, products or services. This can ensure that the significant environmental impacts associated with these aspects are taken into account in setting the environmental objectives. The relation between environmental aspects and impacts is one of cause and effect. An environmental aspect refers to an element of an organization's activity, which can have a beneficial or adverse effect on the environment. For example, it could involve a discharge, an emission, consumption or reuse of a material, or noise. An impact refers to the change which takes place in the environment as a result of the aspect. Examples of impacts might include contamination of water or depletion of a natural resource.

The identification of environmental aspects and the evaluation of environmental impacts is a process that can be dealt with in four steps:

Step 1: Select an activity or process. (The selected activity or process should be large enough for meaningful examination and small enough to be sufficiently understood.)

Step 2: Identify environmental aspects of the activity product or service. (Identify as many environmental aspects as possible associated with the selected activity or process.)

Step 3:Identify environmental impacts. (Identify as many actual and potential, positive and negative, environmental impacts as possible associated with each identified aspect.)

Examples from the three steps are:

Activity, product or service	Environmental Aspect	Environmental Impact
handling of hazardous materials	potential for accidental spillage	contamination of soil or water
product	reformulation of the product to reduce its volume	conservation of natural resources
vehicle maintenance	exhaust emissions	reduction of air pollution

Step 4: Evaluate significance of impact. (The significance of each of the identified environmental impacts can be different for each organization. Quantification can aid judgment. Evaluation can be facilitated by considering environmental concerns (the scale of the impact, the severity of the impact, probability of occurrence, duration of impact) and business concerns (potential regulatory and legal exposure, difficulty of mitigating the impact, costs of mitigating the impact, effect of change on other activities and processes, concerns of interested parties, effects on public image of the organization).)

This section is intended to provide a process for an organization to identify significant environmental aspects that should be addressed as a priority by the organization's environmental management system. This process should take into account the cost and time of undertaking the analysis and the availability of reliable data. Information already developed for regulatory or other purposes may be used in this process. Organizations may also take into account the degree of practical control they may have over the environmental aspects being considered.

Organizations determine what their environmental aspects are taking into account the inputs and outputs associated with their current and relevant past activities, products and services.

The identification of the environmental aspects is an ongoing process that determines the past, current and potential impact (positive or negative) of an organization's activities on the environment. This process also includes the identification of the potential regulatory, legal and business exposure affecting the organization. It can also include identification of health and safety impacts, and environmental risk assessment.

Initial environmental review

An organization with no existing environmental management system should, as a first step, establish its current position with regard to environment by means of a review. The aim should be to consider all environmental aspects of the organization as a basis for establishing the environmental management system. Those organizations with operating environmental management systems do not have to undertake such a review.

The review should cover four key areas:

a) legislative and regulatory requirements;
b) an identification of significant environmental aspects;
c) an examination of all existing environmental management practices and procedures; and
d) an evaluation of feedback from the investigation of previous incidents.

In all cases, consideration should be given to normal and abnormal operations within the organization, and to potential emergency conditions.

A suitable approach to the review may include checklists, interviews, direct inspection and measurement, results of previous audits or other reviews depending on the nature of the activities.

The process to identify the significant environmental aspects associated with the activities at operating units should consider, where relevant:

a) emissions to air;
b) releases to water;
c) waste management;
d) contamination of land;
e) impact on communities;
f) use of raw materials and natural resources; and
g) other local environmental issues.

The process should consider normal operating conditions, shut down and start up conditions, as well as realistic potential significant impacts associated with reasonably foreseeable or emergency situations.

The process is intended to identify significant environmental aspects associated with activities, products or services, and is not intended to require a detailed life cycle assessment. Organizations do not have to evaluate each product, component or raw material input. They may select categories of activities, products or services to identify those aspects that are likely to have a significant impact.

The control and influence over the environmental aspects of products vary significantly, depending on the market situation of the organization. A contractor or supplier to the organization may have comparatively little control, while the organization responsible for product design can alter the aspects significantly by changing for example a single material input. While recognizing that organizations may have limited control over the use and disposal of their products, they should consider, where practical, proper handling and disposal mechanisms. This provision is not intended to change or increase an organization's legal obligations.

Keeping track of legal and other requirements

The organization should establish and maintain procedures to identify, have access to and understand all legal and other requirements to which it subscribes, directly attributable to the environmental aspects of its activities, products or services.

To maintain regulatory compliance, the organization should identify and understand regulatory requirements applicable to its activities, products or services. Regulations can exist in several forms:

- those specific to the activity (e.g., maximum emission or discharge limitations);
- those specific to the organization's products or services (e.g. for a packaging producer; restrictions on the use of certain chemicals or requirements with regard to discarded packaging take-back);
- those specific to the organization's industry;
- general environmental laws; and
- authorizations, licenses and permits.

Several sources can be used to identify environmental regulations and ongoing changes, including all levels of government; industry associations or groups; commercial databases; and professional services.

To facilitate keeping track of all legal requirements, an organization can establish and maintain a profile or compilation of all laws and regulations pertaining to its activities, products or services. Mention in the documentation the date of the latest amendment to the law or regulation you are aware of.

Examples of other requirements to which the organization may subscribe are:

- industry codes of practice (e.g., "Responsible Care", etc.);
- standards (ISO 14001, Eco-Management and Audit Scheme, ISO 9000,...);
- agreements with public authorities (e.g. "environmental covenants", 33/50, etc.);
- eco-label requirements for products (e.g., "blauer engel", "marque retour"; etc.); and
- non-regulatory guidelines (e.g., ICC Business Charter for Sustainable Development, etc.).

Internal priorities and criteria should be developed and implemented where external regulatory and other requirements do not meet the needs of the organization or are non-existent. Internal performance criteria, together with external standards, assist the organization in developing its own objectives and targets. Examples of areas where an organization can have internal performance criteria might include:

- management systems;
- employee responsibilities;
- acquisition, property management and divestiture;
- suppliers;
- contractors;
- product stewardship;
- environmental communications;
- regulatory relationships;
- environmental incident response and preparedness;
- environmental awareness and training;
- environmental measurement and improvement;
- process risk reduction;
- prevention of pollution and resource conservation;
- capital projects;
- process change;
- hazardous material management/substitution;
- waste management;
- water management (e.g., waste, storm, ground);
- air quality management;
- energy management; and transportation.

Setting objectives and targets

The environmental policy is not an end in itself. The environmental policy has to be used together with the results of the environmental review, to develop detailed objectives and targets. Objectives should be established to meet the organization's environmental policy. These objectives are the overall goals for environmental performance identified in the environmental policy. When establishing its objectives an organization should also take into account the relevant findings from environmental reviews, and the identified environmental aspects and associated environmental impacts. In reviewing and analyzing this information, one has to identify priorities (e.g. a situation of non-compliance which puts the whole operation at risk has to be addressed first). Identify the issues of vital importance, high priority, medium priority, and low priority. In setting objectives first address the issues with the highest priority.

Environmental targets can then be set to achieve these objectives within a specified time-frame. The targets should be specific and measurable.

When the objectives and targets are set, the organization should consider establishing measurable environmental performance indicators. These indicators can be used as the basis for an environmental performance evaluation system and can provide information on both the environmental management and the operational systems.

Objectives and targets can apply broadly across an organization or more narrowly to site-specific or individual activities. Appropriate levels of management should define the objectives and targets. Objectives and targets should be periodically reviewed and revised, and should take into consideration the views of interested parties.

When establishing the objectives and targets, the possibility of taking preventative measures have to be considered, as well as the legal and other requirements, the significant environmental aspects, the technological options, and the financial, operational and business requirements, and the views of interested parties. Taking into consideration the financial requirements of the organization does not imply that environmental cost accounting methodologies should be used.

When considering the technological options, one may consider the use of best available technology where economically viable, cost effective and judged appropriate.

Objectives can include commitments to:

- reduce waste and the depletion of resources;
- reduce or eliminate the release of pollutants into the environment;
- design products to minimize their environmental impact in production, use and disposal;
- control the environmental impact of raw material sourcing;
- minimize any significant adverse environmental impact of new developments; and
- promote environmental awareness among employees and the community.

Progress towards an objective can generally be measured using environmental performance indicators such as:

- quantity of raw material or energy used;
- quantity of emissions such as CO_2;
- waste produced per quantity of finished product;
- efficiency of material and energy use;
- number of environmental incidents/accidents;
- percentage of waste recycled;
- percentage recycled material used in packaging;
- number of vehicle kilometers per unit of production;
- specific pollutant quantities (e.g. NOx, SO2, CO, HC, Pb, CFCs);
- investment in environmental protection;
- number of prosecutions; and
- land area set aside for wildlife habitat.

An integrated example	
Policy	Commitment to regulatory compliance
Environmental review	Permit requirements with regard to air emissions are often violated, due to high fuel consumption in manufacturing
Prioritizing	Regulatory authorities threatened to stop the manufacturing if no action was taken - high priority
Objective 1	**reduce energy required in manufacturing operations**
>> Target	achieve 10% reduction of the previous year
>> Indicator	quantity of fuels per unit of production.

Environmental Action Program

The translation of the policy into action takes the form of an environmental action program. Within the general planning of activities, an organization should establish an environmental action program, that addresses all of its environmental objectives. To be most effective the environmental action planning should be integrated into the organization's strategic plan. Environmental action programs should address schedules, resources and responsibilities for achieving the organization's environmental objectives and targets.

Within the framework provided by the environmental planning, an environmental action program identifies specific actions in order of their priority to the organization. These actions may deal with individual processes, projects, products, services, sites or facilities within a site.

Environmental action programs help the organization to improve its environmental performance. They should be dynamic and revised regularly to reflect changes in organizational objectives and targets.

The creation and use of (a) program(s) is a key element to the successful implementation of an environmental management system. The program should describe how the organization's targets will be achieved, including time-scales and personnel responsible for implementing the organization's environmental policy. This program may be sub-divided to address specific elements of the organization's operations. The program should include an environmental review for all new activities.

The program may include, where appropriate and practical, consideration of planning, design, production, marketing and disposal stages. This may be undertaken for both current and new activities, products or services. For products this may address design, materials, production, processes, use and ultimate disposal. For installations or significant modifications of processes this may address planning, design, construction, commissioning, operation and, at the appropriate time determined by the organization, decommissioning.

Underneath you will find a fictive example of an environmental action program of "Testbull Inc.". It is divided into two parts. The first table gives an overview of the environmental action program of the organization as a whole. Each of the action items is further detailed in the department environmental action program.

1996 Environmental Action Program
Testbull Inc.

N°	What	Budget	Who	Time schedule
1.	Water treatment installation	US$ 30,000	John Hooker Process Engineer	Dec. 1996
2.	Selective waste collection	US$ 1,000	Alice Wonderland Environment Coord.	May 1996
3.	Worker environment awareness training	US$ 2,000	Human Resources Department	Sept. - Dec. 1996
4.	...			

1996 Environmental Action Program Process Engineering Department Testbull Inc.				
N°	What	Budget	Who	Time schedule
1.	Water treatment installation	US$ 30,000	John Hooker Process Engineer	Dec. 1996
1.1	Investigate various design possibilities	-	Chris	January
1.2	Obtain quotes for construction of selected installation	-	Sarah	February
1.3	Select construction company	-	Department Meeting	March 1
1.4	Supervise construction activities	-	Gilbert	March - June
1.5	Testing the installation	-	Patrick	July
1.6	Inauguration of installation	US$ 1,000	Tom & Marketing Dept.	August
1.7	Recruiting installation guard	-	John & Human Resources Department	May
1.8	...			

PRINCIPLE 3: IMPLEMENTATION AND OPERATION

The successful implementation of an environmental management system calls for the commitment of all employees of the organization. Environmental responsibilities therefore should not be seen as confined to the environmental function, but may also include other areas of an organization, such as operational management or staff functions other than environmental.

Responsibilities and Accountabilities

The commitment of all employees to the successful implementation of an environmental management system should begin at the highest levels of management. Top management should establish the organization's environmental policy and ensure that the environmental management system is implemented. As part of this commitment, top management should designate (a) specific management representative(s) with defined responsibility and authority for implementing the environmental management system. In large or complex organizations there may be more than one designated representative. In small or medium sized enterprises, these responsibilities may be undertaken by one individual.

It is also important that the key environmental management system responsibilities are well defined and communicated to personnel. People should know whose job it is to do what. The organizational structure usually consists of four main elements: the organizational chart, job descriptions, clear reporting lines and procedures, and performance targets. The organizational chart visualizes the organizational structure, main responsibilities and reporting lines. Issues that could be considered in developing the organizational structure are:

- provision of resources;
- action to prevent non-compliance;
- identifying potential problems;
- recommending solutions to problems and verifying their implementation; and
- acting in emergency situations.

It is often recommended that the environmental management responsibilities should follow the operational hierarchy, so that it becomes part of the everyday management of running the enterprise. The environmental manager should be responsible, either directly or by managing others, for ensuring that the environmental management system is established, implemented and effective. Top management should ensure that an appropriate level of resources are provided to ensure that the environmental management system is implemented and maintained.

Training and Communications

To be successful, responsibilities should be supported by the necessary authority and training to enable the individuals to carry out their tasks effectively. An effective and on-going training program is necessary for all levels of the organization to ensure awareness of environmental issues. Training needs have to be assessed taking into account the job to be carried out, and the skills, education and experience of the individuals in charge. Training should instruct on the organization's environmental policy, objectives and action program. It should address the significant environmental impacts, actual or potential, and the environmental benefits of improved personal performance. Equally, it should highlight the potential consequences of departure from specified operating procedures. A successful training program is an interactive process that provides the participants with information, awareness, knowledge, understanding and motivation. This interactive process requires managers to respond to suggestions and initiatives raised pursuant to the training sessions. Even if the suggestions are not

appropriate, they need to be treated seriously so that the initiative and impetus of the training is maintained. The benefits of training can be quickly lost if the employees feel that the training is carried out in a vacuum, and that on the workfloor managers are not interested in their attempts to apply new found knowledge and understanding. Complete records of all training provided and who participated in it, should be maintained.

To maintain a certain dynamic in the environmental management system, proper internal and external communication procedures are essential. Such a procedure may include a dialogue with interested parties and consideration of their relevant concerns. In some circumstances responses to interested parties' concerns may include relevant information about the environmental impacts associated with the organizations operations. These procedures should also address necessary communications with public authorities regarding emergency planning and other relevant issues.

Documentation

The environmental documentation may be integrated and shared with documentation of other systems implemented by the organization, e.g. quality control and safety procedures. It does not have to be in the form of a single manual.

Environmental records may include:
a) organizational charts;
b) internal standards and operational procedures;
c) site emergency plans;
d) information on applicable environmental laws and other requirements;
e) complaint records;
f) training records;
g) product process information;
h) product information;
i) inspection, maintenance and calibration records;
j) pertinent contractor and supplier information;
k) incident reports;
l) information on emergency preparedness and response;
m) records on significant environmental impacts;
n) audit results; and
o) management reviews.

Proper account should be taken of confidential business information.

The procedures for identification, maintenance and disposition of records should focus on those records needed for the implementation and operation of the environmental management system, as well as those records needed to record the extent to which planned objectives and targets have been met.

The intent of the document control procedures is to ensure that organizations create and maintain documents in a manner sufficient to implement the environmental management system. However, the primary focus should be on the effective implementation of the environmental management system and on environmental performance, and *not* on a complex documentation control system.

Procedures

Carefully written procedures are the basis for implementing the environmental management system. Procedures should specify who is to carry out what tasks, give step-by-step instructions for how tasks are to be accomplished, and include directions for dealing with departures from the procedures. Setting and maintaining effective

environmental procedures involves five stages: identifying environmental aspects, assessing potential environmental impacts, identifying risk control measures, preparing and maintaining procedures to maintain control; and ongoing audit and review of these procedures. The operating procedures and controls should include, where appropriate, consideration of accidental emissions to atmosphere; accidental discharges to water and land; and specific environment and ecosystem effects from accidental releases.

The emergency plans can include:

- emergency organization and responsibilities;
- a list of key personnel;
- details of emergency services (e.g. fire department, spill clean-up services);
- an internal and external communication plan;
- actions taken in the event of different types of emergencies;
- information on hazardous materials, including each material's potential impact on the environment, and measures to be taken in the event of accidental release; and
- training plans and testing for effectiveness.

PRINCIPLE 4: MEASUREMENT AND EVALUATION

Measuring, monitoring and evaluating are key activities of an environmental management system, to ensure that the organization is performing in accordance with the environmental policy, objectives and action program.

In establishing and maintaining procedures for investigating and correcting non-conformance, the organization should include the following basic elements:
a) identifying the cause of the non-conformance;
b) identifying and implementing the necessary corrective action;
c) implementing or modifying controls necessary to avoid repetition of the non-conformance; and
d) recording any changes in written procedures resulting from corrective action.

Audits may be performed by personnel from within the organization or by external persons selected by the organization. In either case the persons conducting the audit should be in a position to do so impartially and objectively.

PRINCIPLE 5: REVIEW AND IMPROVEMENT

The organization should review and continually improve its environment management system, to achieve overall improvement in environmental performance. At regular intervals management should carry out a review of the environmental management system to ensure its continuing suitability and effectiveness.

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.

Some issues to be considered in the review are:

- review of the environmental objectives and targets;
- audit findings;
- concerns amongst relevant interested parties; and
- evaluation of the effectiveness of the environmental management system;
- evaluation of the suitability of the environmental policy and the need for changes in the light of changing legislation, changing expectations and requirements of interested parties, changes in the products or activities of the organization, developments in technology, lessons learned from environmental incidents, market preferences, reporting and communication.

Annex II: Relationship between the ICC Business Charter Principles and the ISO 14001 Elements

ICC Principles	ISO 14001
1. Corporate Priority	●
2. Integrated Management	●
3. Process of Improvement	●
4. Employees Education	●
5. Prior Assessment	
6. Products and Services	
7. Customer Advice	
8. Facilities and Operations	O
9. Research	
10.Precautionary Approach	O
11.Contractors and Suppliers	O
12.Emergency Preparedness	●
13.Transfer of Technology	
14.Contributing to the Common Effort	
15.Openness to Concerns	●
16.Compliance & Reporting	●

● *ISO/DIS 14001 element equivalent to ICC Principle*

O *ISO/DIS 14001 has minimal coverage*

Blank *Voluntary Initiative does not mention*

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Gap Analysis Worksheet

Date:_____ Customer Name:_____

Audit Team:_____ Customer Location:_____

_____ _____

_____ _____

_____

_____

Lead Auditor:_____

ISO 14001 Section 4.2 - Environmental Policy

1.1 Does the organization have an environmental policy?

Notes to Auditor	Observations and Recommendations	Score
Look for environmental policy documents, and relevant policy document procedures or practices for establishing top management policy; and interview personnel who may be familiar with the policy development process. If the policy is not written, interview personnel who can explain the policy.		

1.2 What is/was the role played by top management, specifically in commissioning, reviewing, commenting, approving, signing and/or issuing and communicating the policy?

Notes to Auditor	Observations and Recommendations	Score
Look for policy development procedures or practices for establishing top management policy. Also, interview personnel who may be familiar with the policy development process.		

1.3 Has the organization considered the nature and scale of its activities, products and services, in the development of its policy? How have they done this?

Notes to Auditor	Observations and Recommendations	Score
Look for the organization's identification of environmental aspects (Section 4.3.1). They may be found in documents and through interviews explaining the organization's activities, products and services, and their environmental aspects. Check to see if the policy is consistent with the organization's identification of		

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environmental aspects. Become familiar with the nature, scale and environmental impacts of the organization's activities.

1.4 Does the scope of the policy cover all of the organization's management units within the organization being audited?

Notes to Auditor	Observations and Recommendations	Score
Look at documents and conduct interviews pertaining to an explanation of the organization's activities, products and services, and their environmental aspects.		

1.5 Does the policy contain a commitment to continual improvement?

Notes to Auditor	Observations and Recommendations	Score
Look at environmental policy.		

1.6 Does the policy contain a commitment to prevention of pollution?

Notes to Auditor	Observations and Recommendations	Score
Look at environmental policy.		

1.7 Did the organization make a commitment to comply with relevant environmental legislation and regulations?

Notes to Auditor	Observations and Recommendations	Score
Look at environmental policy.		

1.8 Did the organization make a commitment to comply with all other requirements to which the organization subscribes?

Notes to Auditor	Observations and Recommendations	Score
Look at environmental policy.		

1.9 Does the policy contain any of the following: a) directions for the development and use of objectives and targets for the organization's environmental management system; b) ways to establish the substantive areas or specific goals of the organization; c) serve as a basis for defining the scope of objectives and targets?

Notes to Auditor	Observations and Recommendation	Score
Look at the policy and documents containing the organization's objectives and targets.		

1.10 Is the environmental policy documented?

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Notes to Auditor	Observations and Recommendations	Score
Look at environmental policy.		

1.11 How have the management units within the organization adopted the policy?

Notes to Auditor	Observations and Recommendations	Score
Look for Environmental Management System Documentation (Section 4.4.4) and interview persons responsible for the policy and EMS.		

1.12 Has top management assigned responsibility for periodic review and updating of the environmental policy, its implementation and its communication to internal and external parties?

Notes to Auditor	Observations and Recommendations	Score
Look for Environmental Management System Documentation (Section 4.4.4); records of review and revision of the environmental policy as appropriate; and previous EMS audit findings. Also, interview persons responsible for the policy and EMS.		

1.13 Has the policy been implemented?

Notes to Auditor	Observations and Recommendations	Score
Sample relevant EMS elements, reviewing documentation and conducting interviews. Trace its consistent application by sampling relevant EMS elements described in the environmental management system specification. Also, look at records of review and revision as appropriate of the environmental policy.		

1.14 Has the policy been communicated to all employees?

Notes to Auditor	Observations and Recommendations	Score
Verify through interviews with several employees evidence of communications through such mechanisms as display on bulletin boards; electronic access from workstations; periodic publication in internal communications; display in areas of operation and training programs.		

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1.15 Is the policy available to the public?

Notes to Auditor	Observations and Recommendations	Score
Conduct interviews with individuals responsible for public availability and observe communications through means such as public announcements; publication in annual reports; posting internally and on the Internet; responses to public requests; town meetings; television or radio spots; press clippings; distribution to contractors, suppliers and vendors or other means of display.		

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ISO 14001 4.3 - Planning: Section 4.3.1 - Environmental Aspects

2.1 Does the organization have a procedure to identify environmental aspects of its activities, products and services that it determines it can practically control and have influence over?

Notes to Auditor	Observations and Recommendations	Score
Look for documented procedures or evidence of the application of a procedure to identify environmental aspects. Review the procedure to determine if it provides for consideration where appropriate of the significance of emissions to air; releases to water; contamination of land; waste management; raw material and natural resource consumption; and other local environmental issues under a variety of operational conditions such as start-up, shut-down, normal operations and reasonably foreseeable emergency situations.		

2.2 Was the procedure used to identify those environmental aspects that have or could have significant impacts on the environment?

Notes to Auditor	Observations and Recommendations	Score
Look for documented procedures or evidence of application of a procedure to identify environmental aspects. Conduct interviews with persons responsible for developing, implementing and maintaining the procedure. When interviewing, ask the individuals involved in the process how they identify environmental aspects that have or could have significant impacts on the environment. How do they determine which of them are significant?		

2.3 Has the organization assigned responsibility for periodic review and application of the procedure?

Notes to Auditor	Observations and Recommendations	Score
Interview individuals responsible for developing, implementing and maintaining the procedure. Also, conduct interviews to verify that actual practice reflects stated procedure. Ask who is responsible for: a) reviewing the procedure and b) applying the procedure. When is the procedure performed and updated? At a minimum, it should address changes in processes, new		

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processes, start-up and shut-down, and emergency conditions.

2.4 Are those identified environmental aspects which have significant environmental impacts considered in setting objectives?

Notes to Auditor	Observations and Recommendations	Score
Interview individuals responsible for taking significant environmental aspects related to significant environmental impacts into account in developing objectives and targets. Review the objectives to determine whether significant impacts were considered in setting them.		

2.5 Is the information kept up to date?

Notes to Auditor	Observations and Recommendations	Score
Determine the information used to implement the procedures and the process for keeping the information up to date. Look for evidence of changing circumstances. Also, look for records of the application of the procedure.		

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ISO 14001 4.3 Planning: Section 4.3.2 - Legal and other requirements

3.1 Does the organization have a procedure to identify legal requirements?

Notes to Auditor	Observations and Recommendations	Score
Look for documented procedures or established practices confirmed by interviews, documentation or observation.		

3.2 Does the scope of the procedure encompass applicable legal requirements by reviewing the procedure, not detailed requirements, for whether it covers, for example: a) applicable international, national, regional, state or provincial, and local statutes and regulations; b) requirements specified in permits and other government documents and agreements; c) contracts and other documents that may create binding legal obligations of relevance to environmental management; d) requirements applicable to each of the environmental aspects identified by the organization. See 4.3.1

Notes to Auditor	Observations and Recommendations	Score
Look for information providing a general framework of laws affecting the nature and type of business of the organization. Interview individuals responsible for developing, implementing and maintaining the procedure, and those responsible for taking legal and other requirements into account in developing objectives and targets (Section 4.3.3) and establishing roles and responsibilities (Section 4.4.1). When interviewing, ask individuals involved in the process how they identify environmental aspects that have or could have significant impacts on the environment. How do they determine which of them are significant?		

3.3 Does the organization have a procedure to identify other applicable requirements to which it subscribes?

Notes to Auditor	Observations and Recommendations	Score
Look for documented procedures or established practices. Conduct interviews with persons responsible for taking legal and other requirements into account when developing objectives and targets and establishing roles and responsibilities. Have they considered other requirements, (e.g., Responsible Care, Project XL, Green Lights Program)?		

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3.4 Does the procedure allow the organization to have access to legal and other requirements?

Notes to Auditor	Observations and Recommendations	Score
Look for reports or communications related to implementation and maintenance of the procedure. Also, sample documents specifying legal requirements. Sample how appropriate employees currently gain access to requirements and compare the actual process for access to the procedure.		

3.5 Do applicable persons have access to these requirements?

Notes to Auditor	Observations and Recommendations	Score
Test the system with selected inquiries to verify that actual practice reflects stated procedures.		

3.6 Is the procedure for identification and access maintained?

Notes to Auditor	Observations and Recommendations	Score
Review application of updated procedures and communications of results. Look for examples of corporate or organizational standards, procedures and guidelines, and other internal requirements. Interview individual(s) responsible for maintaining the procedure.		

3.7 Is responsibility for overseeing implementation, periodic review, updating and communicating as appropriate assigned to an individual(s) within the organization?

Notes to Auditor	Observations and Recommendations	Score
Look at organizational charts and job descriptions.		

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ISO 14001 4.3 Planning: Section 4.3.3 - Objectives and Targets

4.1 Does the organization have documented objectives and targets?

Notes to Auditor	Observations and Recommendations	Score
Determine whether the targets satisfy the definition in 3.10 for targets (i.e., that they support the achievement of objectives at each relevant function and level within the organization).		

4.2 Are the objectives and targets established at each relevant function and level within the organization?

Notes to Auditor	Observations and Recommendations	Score
Look at organizational charts and descriptions of relevant activities, products and services for each organizational level as appropriate to the definition of the organization. Interview personnel involved with objectives and targets. Review whether the objectives and targets meet the definitions in the EMS specification (see 3.7 and 3.10) (i.e., whether the objectives and targets are consistent with the environmental policy, whether targets are quantified where practicable, and whether targets provide detailed performance requirements that need to be set and met in order to achieve the objectives).		

4.3 Are the documented objectives and targets maintained?

Notes to Auditor	Observations and Recommendations	Score
Review the application of updated procedures and communication of results. Interview individual(s) responsible for maintaining objectives and targets. Assess whether the responsibility for overseeing implementation, periodically reviewing, updating and communicating changes as appropriate, is assigned to individual(s) within the organization.		

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4.4 Does the process used by the organization to define and review its objectives consider the following in developing its objectives and targets: Significant environmental aspect; legal and other requirements; technological options; financial, operational and business requirements; views of interested parties?

Notes to Auditor	Observations and Recommendations	Score
Look for documents describing the organization's considerations. Interview selected individuals at all levels in the organization involved in the process of establishing and reviewing objectives and targets.		

4.5 Are the objectives and targets consistent with the environmental policy, including the commitment to prevention of pollution?

Notes to Auditor	Observations and Recommendations	Score
Compare organization's objectives and targets to environmental policy.		

ISO 14001 4.3 Planning: Section 4.3.4 - Environmental Management Program(s)

5.1 Has the organization established program(s) for achieving its objectives and targets?

Notes to Auditor	Observations and Recommendations	Score
Look at environmental policy document and environmental management program document.		

5.2 Does the program include a designation of responsibility for achieving objectives and targets at each relevant function and level of the organization?

Notes to Auditor	Observations and Recommendations	Score
Look at organizational charts, documents related to programs or plans, position or individual job descriptions or other documents designed for similar purposes. Also, interview individuals having knowledge of and/or responsibilities related to their organization's achievement of its objectives and targets. Determine by representative sample if responsibility for achievement of applicable objectives and targets at all functions and levels of the organization has been designated to specific positions (e.g., manufacturing/production managers, supervisors and operators), environmental staff (corporate, division/business unit and facility levels) and other functional staff (e.g., human resources, engineering, procurement, legal, public/governmental relations).		

5.3 Are the program(s) for achieving environmental objectives and targets supported by resources and specific time frames for completing tasks and the programs?

Notes to Auditor	Observations and Recommendations	Score
Look for documents or other evidence with information on program plans, resource allocation, schedules and commitments, and management reports or communication to employees. Interview program managers and staff. Determine that methods have been identified to measure progress		

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towards achievement of objectives and targets (Section 4.5.1).

5.4 Are projects involving new or modified activities, products or services amended to ensure the integration of environmental management concerns in project planning, goals, execution and consistent application of the EMS?

Notes to Auditor	Observations and Recommendations	Score
Review a sample of projects or activities documents related to new or modified projects or activities containing plans, goals and execution and modifications to such documents. Interview project managers and teams. Also, review the organization's procedures/practices for capital authorization and approval.		

ISO 14001 4.4 Implementation and Operation: Section 4.4.1 - Structure and Responsibility

6.1 Are roles, responsibilities and authorities clearly defined, documented and communicated throughout the organization?

Notes to Auditor	Observations and Recommendations	Score
Interview employees, managers and supervisors at all levels within the organization. Look at job descriptions, organizational charts and functional statements and related documents, and records of communications and responses which trace throughout the organization, the implementation of selected environmental management system programs related to the achievement of the organization's objectives and targets.		

6.2 Have the human resources, financial resources and technology essential to the implementation and control of the EMS been defined and provided, and are they consistent with the EMS?

Notes to Auditor	Observations and Recommendations	Score
Look at processes for capital appropriation and budget, staffing plans and vacancies for environmental programs, records on the relative priority of environmental projects, and trends and issues raised in prior EMS and related audits and reviews.		

6.3 Have management representative(s) been appointed and was that appointment made by top management?

Notes to Auditor	Observations and Recommendations	Score
Look at reports to management and others within the organization by the appointee, management review records (e.g., Section 4.6), and documentation on roles, responsibilities and authorities. Also, interview the organization's senior EMS managers and top management.		

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Review a sample of the mechanisms used and frequency of use to report on performance of the EMS to top management (Section 4.6).

6.4 Do the roles and responsibilities of the management's representative(s) fulfill the duties described in a) and b) of Section 4.4.1?

Notes to Auditor	Observations and Recommendations	Score
Look at reports to management and others within the organization by the appointee, management review records (e.g., Section 4.6), and documentation on roles, responsibilities and authorities. Also, interview the organization's senior EMS managers and top management.		

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ISO 14001 4.4 Implementation and Operation: Section 4.4.2 - Training, Awareness and Competence

7.1 Has the organization identified what job functions may have a significant impact on the environment?

Notes to Auditor	Observations and Recommendations	Score
Look for documentation or other evidence of training needs, documentation of identification of personnel or positions requiring training, and appropriate individual professional development plans or job descriptions.		

7.2 Has the organization identified and evaluated the training needs for: a) these personnel, including all personnel and contractors where appropriate whose functions may create a significant impact on the environment such as operations, maintenance, procurement, etc. and b) for providing general awareness to all employees and managers?

Notes to Auditor	Observations and Recommendations	Score
Look for documentation or other evidence of training needs; references to and/or adoption of training requirements in regulations, professional guidelines, company policies; and evidence of contract language related to training, on the job experience or other qualification requirements where contractor training is appropriate.		

7.3 Is there a training program or process to establish training requirements for these personnel?

Notes to Auditor	Observations and Recommendations	Score
Look for documentation of training, on-the-job experience or other evidence of training; interview instructors and trainees in selected training programs. Verify that there is a training program or process to establish training requirements for these personnel by reviewing, for example:		

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• The identification of employee training needs for these job functions • The development of training plans to address defined needs • Training of target employee groups • Documentation of training received • Verification of conformance of training program to legal or organizational requirements (through sampling and review of overall approach, not an examination of all legal requirements) Review a sample of such training programs or plans to determine if they conform to the training requirements established by the organization for the functions performed, offer appropriate detail, offered by qualified instructors and reflecting training required, and that a system is in place to determine that the training was understood. Verify that training is taking place and that refresher training is provided.	

7.4 Has the organization established procedures to ensure all employees are aware of its environmental policy and the environmental aspects and impacts of their jobs, the scope of which covers all elements of the required procedure in 4.4.2?

Notes to Auditor	Observations and Recommendations	Score
Look for evidence of implementation of procedures such as: training records, relevant content of training curricula or internal communications, interviews with employees, managers and instructors to assess familiarity with issues and/or observation of communications and communications mechanisms within the workplace.		

7.5 Has the responsibility been defined and assigned for reviewing, updating and overseeing implementation of procedures?

Notes to Auditor	Observations and Recommendations	Score
Look for documentation or other evidence, including employee interviews, that responsibility has been defined and assigned.		

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7.6 Are the procedures reviewed and revised periodically as appropriate to reflect changes in policy or the requirements of the EMS?

Notes to Auditor	Observations and Recommendations	Score
Look for evidence that procedures have been reviewed and revised as necessary as required by the procedures when changes in policy or the requirements of EMS occur.		

7.7 Does the organization require specific levels of education, training and/or experience as the basis for the requirements for personnel performing tasks which may cause significant environmental impacts?

Notes to Auditor	Observations and Recommendations	Score
Look at the organization's list of covered personnel, a sample of training or professional development records and interview and observe a sample of covered individuals in selected positions.		

7.8 Does the organization have a process to evaluate competency for these individuals who may have a significant environmental impact?

Notes to Auditor	Observations and Recommendations	Score
Look for evidence of competency including records of environmental operations for which demonstrated competency is needed and check records of training tests or other aides used to verify knowledge and skill. Interview managers, trainees and others who have responsibility relating to evaluation of competency of covered personnel. Verify the application of this evaluation process to a sample of individuals, especially those who carry out specialized environmental management functions whose job may cause significant environmental impacts.		

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ISO 14001 4.4 Implementation and Operation: Section 4.4.3 - Communication

8.1 Do procedures exist for internal communications between various functions and levels of the organization related to the environmental management system and environmental aspects?

Notes to Auditor	Observations and Recommendations	Score
Look for documented or other evidence of internal communications procedures or established practices (company news letters, memos, etc.).		

8.2 Has responsibility been assigned for reviewing, updating and overseeing implementation of the internal communication procedure?

Notes to Auditor	Observations and Recommendations	Score
Look for evidence that this responsibility has been assigned.		

8.3 Has the internal communications procedure been applied?

Notes to Auditor	Observations and Recommendations	Score
Look at a sample of communications between management and operating personnel as well as between various functional areas for specific types of communications and problems or concerns. Interview employees/managers knowledgeable or responsible for communications related to the implementation of the EMS.		

8.4 Is there a procedure for receiving, documenting and responding to communications from external interested parties regarding the organization's environmental aspects and EMS?

Notes to Auditor	Observations and Recommendations	Score
Look for documented procedures or evidence of established practices for communications with external		

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interested parties, and look at environmental policy and relevant voluntary commitments and legal requirements.

8.5 Has the organization assigned responsibility for these activities including reviewing and updating the procedure where appropriate?

Notes to Auditor	Observations and Recommendations	Score
Look for evidence that responsibility has been assigned including interviews with employees and management.		

8.6 Is the procedure for receiving, documenting and responding to external communications followed?

Notes to Auditor	Observations and Recommendations	Score
Trace a sample of inquiries from external parties (if appropriate) and responses to them.		

8.7 Has the organization made and documented its decisions regarding whether it will receive, document and respond to relevant communications from external interested parties information regarding its significant environmental aspects?

Notes to Auditor	Observations and Recommendations	Score
Look for documentation or other evidence of decisions regarding communications to external interested parties.		

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ISO 14001 4.4 Implementation and Operation: Section 4.4.4 - Environmental Management System Documentation

9.1 Does the organization have written or electronic information describing the requirements of the EMS, their interaction and cross-referencing related documents?

Notes to Auditor	Observations and Recommendations	Score
Look at written or electronic versions of the organization's EMS and related documents.		

9.2 Does the scope of the EMS documentation and related documents cover all elements of the ISO 14001 specification?

Notes to Auditor	Observations and Recommendations	Score
Look for written copies or electronic versions of the organization's EMS and related documents.		

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ISO 14001 4.4 Implementation and Operation: Section 4.4.5 - Document Control

10.1 Determine whether the organization has established document control procedure(s) to ensure that: a) the documents can be located.

Notes to Auditor	Observations and Recommendations	Score
Document control procedure(s).		
Observations in the workplace.		
Interviews.		
Organization's EMS documents.		

10.2 Determine whether the organization has established document control procedure(s) to ensure that: b) they are periodically reviewed, revised as necessary and approved for adequacy by authorized personnel.

Notes to Auditor	Observations and Recommendations	Score
Document control procedure(s).		
Observations in the workplace.		
Interviews.		
Organization's EMS documents.		

10.3 Determine whether the organization has established document control procedure(s) to ensure that: c) the current versions of relevant documents are available at all locations where operations essential to the effective functioning of the system are performed.

Notes to Auditor	Observations and Recommendations	Score
Document control procedure(s).		
Observations in the workplace.		
Interviews.		
Organization's EMS documents.		

10.4 Determine whether the organization has established document control procedure(s) to ensure that: d) obsolete documents are promptly removed from all points of issue and points of use or otherwise assured against unintended use.

Notes to Auditor	Observations and Recommendations	Score

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Document control procedure(s).

Observations in the workplace.

Interviews.

Organization's EMS documents.

10.5 Determine whether the organization has established document control procedure(s) to ensure that: e) any obsolete documents retained for legal and/or knowledge preservation purposes are suitably identified.

Notes to Auditor	Observations and Recommendations	Score
Document control procedure(s).		
Observations in the workplace.		
Interviews.		
Organization's EMS documents.		

10.6 Determine document legibility, identification, retention and filing methods.

Notes to Auditor	Observations and Recommendations	Score
Document control procedure(s).		
Interviews.		
Organization's EMS documents.		

10.7 Determine if the organizationís EMS document control procedure(s) clearly establishes responsibility for the creation and modification of the various types of documents.

Notes to Auditor	Observations and Recommendations	Score
Document control procedure(s).		
Observations in the workplace.		
Interviews.		
Organization's EMS documents.		

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ISO 14001 4.4 Implementation and Operation: Section 4.4.6 - Operational Control

11.1 Determine whether the organization has identified those operations and activities that are associated with its significant environmental aspects.

Notes to Auditor	Observations and Recommendations	Score
Records of the process used to identify operations and activities. List of operations and activities that are identified with the organization's significant environmental aspects. Any Environmental Risk Assessments for operations and activities that are identified with the organization's significant environmental aspects. Any: a) critical equipment lists, b) process flowcharts and/or c) site maps.		

11.2 Determine whether the organization has documented procedures which stipulate operating criteria and operational controls for identified operations and activities.

Notes to Auditor	Observations and Recommendations	Score
Documentation of standard operating procedures for identified operations and activities. Observation of practices of key operations and activities. Standard practices or references on environmental criteria and operational controls of key operations.		

11.3 Determine if the organization has assigned responsibility for these activities including reviewing and updating the procedure where appropriate.

Notes to Auditor	Observations and Recommendations	Score
Interview persons who wrote operational control documents. Look at organizational charts.		

11.4 Determine whether the organization has procedures related to the significant environmental aspects of goods and services which establish and communicate

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operational control requirements to relevant suppliers and contractors related to these significant environmental aspects.

Notes to Auditor	Observations and Recommendations	Score
Documents or other evidence identifying critical goods and services provided by suppliers and contractors.		

11.5 Determine if the organization has assigned responsibility for these activities including reviewing and updating procedures where appropriate.

Notes to Auditor	Observations and Recommendations	Score
Interview individuals responsible for implementing and maintaining the procedures and verify that actual practice reflects stated procedure.		

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ISO 14001 4.4 Implementation and Operation: Section 4.4.7 - Emergency Preparedness and Response

12.1 Does the organization have any procedures in place to: a) identify the potential for accidents and emergency situations b) respond to accidents and emergency situations.

Notes to Auditor	Observations and Recommendations	Score
Documented procedures or evidence of established practices for identifying the potential for accidents and emergency situations. Documented procedures or other evidence for responding to accidents and emergencies (look for regulatory requirements such as SPCC Plans, RCRA Hazardous Waste Contingency Plans, Facility Response Plans, Storm Water Pollution Prevention Plans, OSHA Hazardous Material Plans, etc., and any other regulatory or non-regulatory facility response, or emergency planning documents). Interviews with personnel involved with or responsible for emergency planning and response to determine what procedures are established, if they are implemented and communicated.		

12.2 Does the scope of the procedures address prevention and mitigation of environmental impacts associated with accidents and emergencies?

Notes to Auditor	Observations and Recommendations	Score
Documentation or other evidence outlining the risk potential for accidents and emergencies, their environmental impacts, potential for mitigation and/or prevention.		

12.3 Are the procedures maintained, reviewed and updated regularly, and as needed, particularly after the occurrence of accidents or emergency situations?

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Notes to Auditor	Observations and Recommendations	Score
Records or other evidence of procedures and plans. Records or evidence of actions taken in response to and following emergency or accident situations. Interviews with key staff who are aware of specific incidents or who are responsible for maintaining, reviewing and updating the plans and procedures.		

12.4 Are the procedures periodically tested where practicable?

Notes to Auditor	Observations and Recommendations	Score
Records or evidence of tests, drills and/or exercises; records or evidence of changes to relevant procedures and plans where necessary to verify that they are tested periodically and that they are modified as necessary based on the test results.		

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ISO 14001 4.5 Checking and Corrective Action: Section 4.5.1 - Monitoring And Measurement

13.1 Determine if the organization has established procedures to monitor and measure, on a regular basis, key characteristics of operations and activities that the organization has identified as having a significant impact on the environment.

Notes to Auditor	Observations and Recommendations	Score
Documented procedures or other evidence of monitoring and measurement . Organization's identification of significant impacts (Section 4.2.1). Organization's identification of operations and activities which can have significant impacts (Section 4.4.6).		

13.2 Determine if the procedures include requirements to record information which tracks performance relevant to operational controls, objectives and targets, and record calibration and maintenance of relevant equipment.

Notes to Auditor	Observations and Recommendations	Score
Documented procedures or other evidence of monitoring and measurement. Records or other evidence of monitoring and measurement, calibration and maintenance of relevant equipment. Interview the users of the recorded information and track performance and conformance with the organization's objectives and targets. Observation of monitoring and measurement.		

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13.3 Determine if the organization has established and maintained a documented procedure for periodically evaluating compliance with legislation and regulations considered relevant by the organization.

Notes to Auditor	Observations and Recommendations	Score
Documentation or other evidence of the procedures for compliance evaluation. Sample compliance evaluation results and records of the evaluations. Schedule for compliance evaluation. Sample of written records reporting results.		

13.4 Determine whether the organization considered relevant environmental legislation and regulation in defining the scope of the compliance evaluations performed.

Notes to Auditor	Observations and Recommendations	Score
Documentation or other evidence of the procedures for compliance evaluation. Interview with persons who developed procedures for compliance evaluations.		

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ISO 14001 4.5 Checking and Corrective Action: Section 4.5.2 - Non-conformance, Corrective and Preventative Action

14.1 Determine if the organization has established procedures for handling and investigating non-conformance with the organization's EMS and whether such procedures include identification of the cause of the non-conformance and initiating and completing both corrective and preventative action.

Notes to Auditor	Observations and Recommendations	Score
Are there records related to implementation and design of the procedure? If no, interview the individuals responsible for establishing and maintaining the procedure and verify that the actual practice reflects stated procedure.		

14.2 Determine whether roles, responsibilities and authorities for: 1) investigating non-conformance, 2) mitigation of impacts caused by non-conformance, 3) initiating corrective and preventative action, and 4) reviewing and revising this procedure as appropriate, are clearly defined.

Notes to Auditor	Observations and Recommendations	Score
Interviews with individuals with knowledge of or responsibility for these activities.		

14.3 Any corrective or preventative action taken to eliminate the causes of actual and potential non-conformances shall be appropriate to the magnitude of problems and commensurate with the environmental impact encountered.

Notes to Auditor	Observations and Recommendations	Score
Are there records of actions taken in response to non-conformance?		

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If yes, what types and patterns of non-conformance exist?

Is there evidence of changes to procedures and/or operational controls in response to non-conformance?

ISO 14001 4.5 Checking and Corrective Action: Section 4.5.3 - Records

15.1 Determine whether the organization has established and maintained procedures to identify, maintain and dispose of environmental records.

Notes to Auditor	Observations and Recommendations	Score
Are there procedures in place for environmental record keeping?		
If so, are the procedures maintained (and up to date)?		
Is there a procedure to identify environmental records?		
Is there a procedure to dispose of environmental records as they become dated?		

15.2 Determine whether environmental records in the procedure include training records, the results of audits and reviews.

Notes to Auditor	Observations and Recommendations	Score
Does the environmental records master list include training records, the results of audits and reviews?		

15.3 Determine if environmental records are legible, identifiable and traceable.

Notes to Auditor	Observations and Recommendations	Score
Is a sample of environmental records legible?		
Is a sample of environmental records identifiable?		
Is a sample of the environmental records traceable?		

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15.4 Review the storage and retrieval mechanisms for the records. Verify that documents are retrievable and protected by testing the retrieval system and retrieving a sample of selected records.

Notes to Auditor	Observations and Recommendations	Score
Observe storage practices and facilities where appropriate. Are the records retrievable? Are record retention times established and recorded?		

15.5 Determine whether the organization has the records necessary to demonstrate conformance to the EMS specification.

Notes to Auditor	Observations and Recommendations	Score
Do available records demonstrate conformance to the standard?		

ISO 14001 4.5 Checking and Corrective Action: Section 4.5.4 - Environmental Management System Audit

16.1 Determine whether the organization has a program and procedure for periodic environmental management system audits.

Notes to Auditor	Observations and Recommendations	Score
Does the organization have a documented program description and procedure or evidence of established practice for periodic environmental management system audits? Are audit schedules available?		

16.2 Determine the scope of EMS audits performed and whether they are sufficient to meet the objectives of the EMS audit.

Notes to Auditor	Observations and Recommendations	Score
Review audit guidelines and reports. Do the audits reveal whether the EMS has been properly implemented and maintained?		

16.3 Determine whether audit results are communicated to management.

Notes to Auditor	Observations and Recommendations	Score
Has the results of audits been communicated to management?		

16.4 Determine whether the audit program and procedure provides for audit frequency and scope and use of methodologies appropriate to the organization's determination of the environmental importance of the activity concerned and results of previous audits.

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Notes to Auditor	Observations and Recommendations	Score
Do audit program description and procedures cover audit frequency? Do audit program description and procedures cover audit scope? Do audit program description and procedures cover methodologies used in conducting audits? Do audit program description and procedures cover responsibilities for conducting audits and reporting results?		

ISO 14001 4.6 Management Review

17.1 Determine whether there is a documented management review process.

Notes to Auditor	Observations and Recommendations	Score
Are there documents or other evidence of the management review?		

17.2 Determine whether the process involves top management and at a minimum those top managers with roles, responsibilities and authorities within the EMS.

Notes to Auditor	Observations and Recommendations	Score
Has management review led to changes to the EMS, as appropriate?		

17.3 Determine whether top management has established intervals for review of the EMS.

Notes to Auditor	Observations and Recommendations	Score
Has top management established intervals for review of the EMS?		

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17.4 Determine if management reviews have been conducted at the established intervals and that their scope is consistent with the purposes established by the EMS specification.

Notes to Auditor	Observations and Recommendations	Score
Is there evidence of progress made to attain environmental objectives and targets within stated time frames?		

17.5 Determine if issues found during management reviews have resulted in consideration by management of possible need for changes to policy, objectives and other elements of the EMS.

Notes to Auditor	Observations and Recommendations	Score
Were changes made to the EMS as reflected in management review documents?		

17.6 Determine if the management review considered potential need for follow up recommendations and changes to the EMS that may derive from EMS audit results, other assessments, reports of non-conformity, changing circumstances and other related information.

Notes to Auditor	Observations and Recommendations	Score
Is there evidence that information about emergencies, critical issues and major EMS performance problems is available for and considered during the management review process? Is there evidence that management reviews program time tables and progress reports to ensure completion of outstanding objectives?		

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1.0 Objective

On May 19, and 20, 1997 the Lake Erie Manufacturing Extension Partnership (Lake Erie MEP), a division of Edison Industrial Systems Center (EISC), conducted a comprehensive gap analysis to the ISO 14001, environmental management systems standard for a glass manufacturing facility located in southeastern Michigan.

The gap analysis was conducted with the purpose of comparing the facility's existing environmental management system with the requirements set forth in ISO 14001 - Specification. The results of this gap analysis will provide a benchmark from which action plans can be developed for achieving conformance and/or certification to the ISO 14001 standard.

2.0 Gap Analysis Criteria

The gap analysis was conducted by utilizing a preliminary ISO 14001 gap analysis tool which was developed by a project team coordinated by Lake Erie MEP and sponsored through the National Institute of Standards Technology (NIST). The gap analysis tool consisted of 95 questions that were focused on the seventeen requirements of the ISO 14001 standard. Verification of responses to these questions was conducted as appropriate to determine the extent of the system's application and effectiveness. A value of 0, 1, or 2 was assigned to each question based on the company's approximate position with respect to full conformance with the ISO 14001 standard. Using these scores, an estimated percent of conformance to each of the seventeen elements of the ISO 14001 standard was determined.

The scope of the gap analysis included all areas of the facility related to environmental systems as well as the interfaces between the facility and the corporate environmental affairs department.

3.0 General Facility Background

The southeastern MI facility, manufactures glass products for the automotive industry, and has a SIC code of 3231. The facility is approximately 200,000 square feet in size, maintains a work force of about 300 people, and is currently certified to the QS-9000 standard. This facility was selected by corporate environmental affairs as a "pilot" facility for the purpose of developing an ISO 14001 implementation strategy for potential application at all company manufacturing locations. The facility Quality/Environmental Manager was the audit team's contact during the gap analysis, and holds the position of environmental coordinator, as well as quality manager, and quality management representative for the facility.

4.0 Summary of Results

Out of a total possible score of 190 points, the facility scored 105 placing the facility at 55.3% of full conformance to the ISO 14001 standard. Five major areas of non-conformance were identified, including: EMS auditing, Management Review, Environmental Aspects and Impacts, Environmental Management System Communication, and Environmental Management Programs for achieving Objectives and Targets. Some areas where deficiencies were identified require support at the corporate level.

Several strengths were also noted during the assessment and these included sections of the standard covering Legal & Other Requirements, Emergency Preparedness and Response plans, Procedures for Corrective & Preventative Action, and Document and Records Control. The facility utilized the existing QS-9000 structure in order to satisfy some of the ISO 14000 requirements. Because of the similarity between some the sections of the two standards, the QS-9000 system can directly satisfy requirements in ISO 14000, particularly in the areas mentioned above.

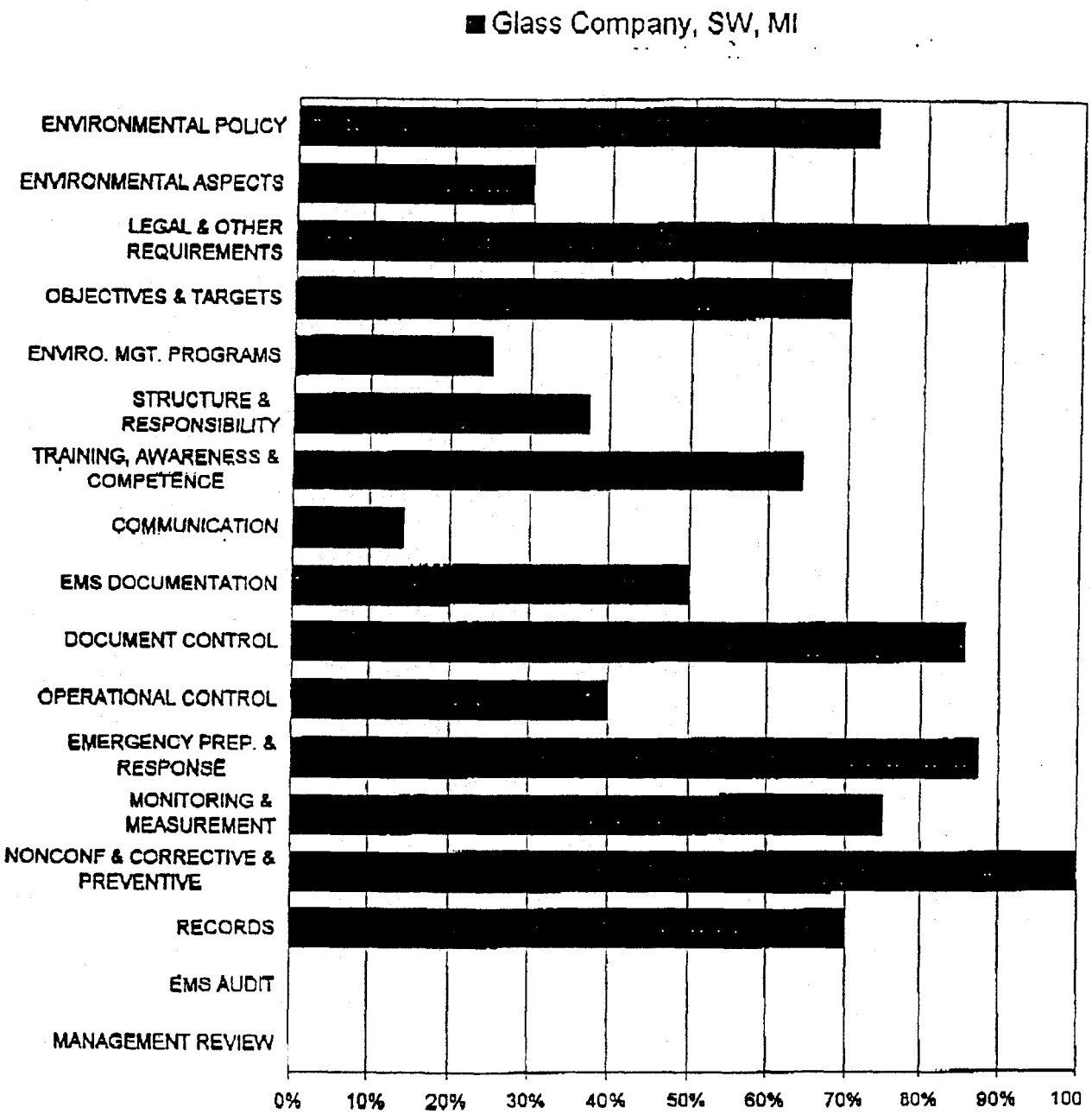
In order to achieve full conformance to the ISO 14001 standard, the facility can continue to integrate EMS elements into the QS-9000 system, or develop a parallel system with references to the QS-9000 system. Additionally, support at the corporate level will be necessary to initiate changes to the policy, and to establish procedures consistently across the company for aspects identification, management reviews, and objectives & targets.

Detailed descriptions of each of the findings are presented in Section 5.0.

ISO 14000 GAP ANALYSIS

PERCENT COMPLETED

DRAFT



Revision: 5/20/97

ISO 1400[illegible] ANALYSIS

[illegible]/97

* no of "questions" in element x 2 pts, per "question"; e.g. 1.1 to 1.15 = 15 x 2 = 30

FOR: Glass Company, SW, MI

ELEMENT	ELEMENT DESCRIPTION	POINTS RECEIVED	POINTS POSSIBLE *	PERCENT COMPLETE
1	ENVIRONMENTAL POLICY	22	30	73%
2	ENVIRONMENTAL ASPECTS	3	10	30%
3	LEGAL & OTHER REQUIREMENTS	13	14	93%
4	OBJECTIVES & TARGETS	7	10	70%
5	ENVIRO. MGT. PROGRAMS	2	8	25%
6	STRUCTURE & RESPONSIBILITY	3	8	38%
7	TRAINING, AWARENESS & COMPETENCE	9	14	64%
8	COMMUNICATION	2	14	14%
9	EMS DOCUMENTATION	2	4	50%
10	DOCUMENT CONTROL	12	14	86%
11	OPERATIONAL CONTROL	4	10	40%
12	EMERGENCY PREP. & RESPONSE	7	8	88%
13	MONITORING & MEASUREMENT	6	8	75%
14	NONCONF & CORRECTIVE & PREVENTIVE	6	6	100%
15	RECORDS	7	10	70%
16	EMS AUDIT	0	10	0%
17	MANAGEMENT REVIEW	0	12	0%
	GRAND TOTAL	105	190	
	PERCENT COMPLETE			55%

see "scoring" code at top of worksheet
0 = none, 1 = partial, 2 = yes

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5.3 Initial Environmental Review Questionnaire

5.3.1 Methodology

The questionnaire follows the ISO 14001 requirements with slight modifications (e.g. it includes external environmental reporting, which is not required by ISO 14001). There are six sections. Within each section a number of questions have to be answered with scores ranging from 0 (worst) to 3 (best). The score indicates the effort needed in terms of human and financial resources to meet the specific statement:

- 0 points: huge effort needed (= 0% compliance with the EMS requirements)
- 1 points: high effort needed
- 2 points: moderate effort needed
- 3 points: no effort needed (= 100% compliance with the EMS requirements)

Adding up the scores in each section and comparing them to the maximum possible score (= benchmark) gives a company-specific profile of strengths and weaknesses.

5.3.2 Questionnaire

- Module 1: Commitment and Environmental Policy ..... page 72
- Module 3: Planning the Environmental Policy 73
- Module 4: Implementing the Environmental Policy 74
- Module 5: Measurement and Evaluation 75
- Module 6: Audits and Review 76
- Module 7: External Environmental Communication 77

Company name: Auditers name: EMS Module	Commitment and Evironmental Policy	Date:
EMS-Aspect	*Issue*	*Assessment*
Commitment	• Top management has made a commitment to address environmental issues related to the organization's activities, products and services.	
Environmental Policy	• Top management has defined an environmental policy. • The environmental policy is appropriate to the nature, scale and environmental impacts of its activities, products and services. • The environmental policy includes a commitment to: a) prevent pollution. b) continuous improvement. c) comply with environmental regulations and other requirements to which the organization subscribes. • The environmental policy provides a framework for setting and reviewing environmental objectives and targets. • The environmental policy is documented and communicated to all employees. • The environmental policy is available to the public.	
Total		

score	Effort needed in terms of human and financial ressources to comply with the EMS standard: huge: 0 points high: 1 point moderate: 2 points no effort: 3 points

Table 18: Initial Environmental Review Questionaire for Modul 1

Company name: Auditers name: EMS Module	Planning the Evironmental Policy	Date:
EMS-Aspect	*Issue*	*Assessment*
Environmental Aspects	• The organization has established and maintained a procedure to identify the environmental aspects of its activities, products and services, in order to determine those which can have significant impacts on the environment. • The organization has ensured that the aspects related to these significant impacts are considered in setting environmental objectives. • The information about significant impacts and related aspects is up-to-date.	
Legal and other Information	• The organization has established and maintained a procedure to identify and have access to legal requirements directly applicable to the environmental aspects of its activities, products and services. • The organization has established and maintained a procedure to identify and have access to other requirements to which the organization subscribes, directly applicable to the environmental aspects of its activities, products and services.	
Environmental Objectives and Targets	• The organization has established and maintained documented environmental objectives. • The organization has established and maintained documented, and whenever possible, quantified environmental targets. • The environmental objectives and targets are set for each relevant function and level within the organization. • When establishing its objectives, the organization has considered legal and other requirements, its significant environmental aspects, its technological options and its financial, operational and business requirements and the views of interested parties. • The environmental objectives and targets are consistent with the environmental policy and the required commitments.	
Environmental Management Program(s)	• The organization has established and maintained environmental management program(s) for achieving its environmental objectives and targets. • The environmental management program(s) include responsibilities at each relevant function and organizational level. • The environmental management program(s) include the means and timeframe by which they are to be achieved • The organization has established a procedure to ensure that environmental aspects are included in projects relating to new developments of activities, products and services.	
Total		

score	Effort needed in terms of human and financial ressources to comply with the EMS standard: huge: 0 points high: 1 point moderate: 2 points no effort: 3 points

Table 19: Initial Environmental Review Questionaire for Modul 3

Company name: Auditers name: EMS Module	Implementing the Evironmental Policy Date:	
EMS-Aspect	*Issue*	*Assessment*
Structure and Responsibility	• The organization has defined, documented and communicated roles, responsibilities and authority. • The organization has provided human and financial resources to implement and control the EMS. • The organization has appointed a specific management representative who ensures that the EMS is in line with the EMS requirements and reports the performance to top management.	
Training, Awareness and Competence	• The organization has defined training needs for those personnel whose work may create a significant environmental impact. • Personnel at each relevant function and level are aware of a) the importance of meeting the requirements of the EMS. b) the environmental impact of their work activities and the benefits to improve performance. c) their roles and responsibilities within the EMS. d) the potential consequences of departure from specific operating procedures.	
Internal Communication	• The organization has established and maintained a procedure for communicating between various levels and functions within the organization.	
EMS Documentation	• The organization has established and maintained information to describe the core elements of the EMS and their interaction. • The organization has established and maintained information to provide direction to related documentation.	
Document Control	• The organization has established and maintained a procedure for controlling all EMS documents (properly filed, reviewed, up-to-date). • Procedures and responsibility are established and maintained to create and modify documents.	
Operational Control	• The organization has identified those operations and activities that are associated with the identified significant environmental aspects. • The organization has planned these activities (including maintenance) to ensure that they are carried out under specified conditions.	
Emergency Preparedness and Response	• The organization has established and maintained procedures to identify the potential for and response to accidents and emergency situations. • The organization has tested these procedures and revised them after accidents.	
Total		

score	Effort needed in terms of human and financial ressources to comply with the EMS standard: huge: 0 points high: 1 point moderate: 2 points no effort: 3 points

Table 20: Initial Environmental Review Questionaire for Modul 4

Company name: **Auditers name:** **EMS Module**	**Measurements and Evaluation** Date:	
EMS-Aspect	***Issue***	***Assessment***
Environmental Data Management	• The organization has established and maintained documented procedures to monitor and measure on a regular basis the key factors that can have a significant environmental impact. Monitoring equipment is calibrated and maintained. • The organization has established and maintained information about relevant environmental regulations.	
Performance Evaluation	• The organization evaluates and documents performance related to its environmental objectives and targets. • The organization evaluates and documents compliance with environmental regulations.	
Corrective and Preventive Actions	• The organization has established and maintained procedures for defining responsibility and authority for handling and investigating non-conformance and for initiating and completing corrective and preventive actions. • The organization has established a procedure to implement and record any changes in the documented procedures resulting from corrective and preventive actions.	
Records	• The organization has established and maintained procedures for the identification, maintenance and disposition of environmental records, including training records and the results of audits and reviews. • The environmental records are legible, identifiable and traceable to the activities, products and services involved. • The environmental records are stored and maintained in such a way that they are readily retrievable and protected against damage, deterioration or loss.	
Total		

score	Effort needed in terms of human and financial ressources to comply with the EMS standard: huge: 0 points high: 1 point moderate: 2 points no effort: 3 points

Table 21: Initial Environmental Review Questionaire for Modul 5

Company name: Auditers name: EMS Module	Audits and Review	Date:
EMS-Aspect	*Issue*	*Assessment*
EMS Audit	• The organization has established and maintained procedures for periodic EMS audits to be carried out, in order to determine whether or not the EMS: a) conforms to planned arrangements for environmental management, *including the requirements of the EMS standard.* b) is properly implemented and maintained. • The organization has established and maintained procedures for periodic EMS audits to be carried out, in order to provide information on the results of audits to management (including top management). • The audit procedures cover the audit scope, frequency and methodologies as well as responsibilities and requirements for conducting the audit and reporting the results.	
Management Review	• The organization's top management reviews the EMS periodically to evaluate the suitability, adequacy and effectiveness of the EMS. • The organization's top management reviews the EMS periodically to determine the necessity to implement changes to the EMS. • The review is documented.	
Total		

score	Effort needed in terms of human and financial ressources to comply with the EMS standard: huge: 0 points high: 1 point moderate: 2 points no effort: 3 points

Table 22: Initial Environmental Review Questionaire for Modul 6

Company name: Auditers name: EMS Module	External Environmental Communication	Date:
EMS-Aspect	*Issue*	*Assessment*
Environmental Report	• The organization publishes an external environmental report which covers the company's environmental policy, the objectives and targets, the environmental performance, the environmental management programs and the structure of the EMS. • The environmental report is validated by external experts.	
Continuous External Communication	• The organization considers processes for external communication about its significant environmental aspects, and records its decision. • The organization has established and maintained procedures to identify significant environmental aspects of goods and services used by the organization and has communicated relevant procedures and requirements to suppliers and contractors. • The organization has established and maintained procedures to the identifiable significant environmental aspects of goods and services produced by the organization and communicated relevant procedures and requirements to customers. • The organization has established and maintained procedures for receiving, documenting and responding to relevant communication from external interested parties.	
Total		

score	Effort needed in terms of human and financial ressources to comply with the EMS standard: huge: 0 points high: 1 point moderate: 2 points no effort: 3 points

Table 23: Initial Environmental Review Questionaire for Modul 7

5.4 Terms

Below is an alphabetical list of terms and definitions used in this handbook. The use of these terms and definitions varies largely from one author to another. The list below relies on definitions used by internationally recognized organizations (e.g. ISO, SCC, SETAC), environmental agencies (e.g. Environmental Protection Agency of the USA) or research reports of large groups of scientists and projects [e.g. SCHALTEGGER & KUBART 1995[. As long as „ISO 14050: Terms and Definitions" is NOT finalized, environmental managers will have to deal with this terminology problem.

Abiotic Resources

Resources which are considered abiotic and therefore not renewable. Zinc ore and crude oil are examples of abiotic resources [HEIJUNGS et al. 1992[.

Ancillary Material

Material that is not used directly in the formation of a product or service [SETAC 1991].

Auditing

See environmental management system audit.

Biotic Resources

Resources which are considered biotic and therefore renewable. The rainforests and tigers are examples of biotic resources [HEIJUNGS et al. 1992].

By-Product

A useful and marketable product or service that is not the primary product or service being produced [EPA 1993b]. See also co-product.

Certification

The procedure by which third party gives written assurance that a product, process, or service conforms to specific requirements [CASCO]. See also registration.

Characterization

Characterization aggregates classified environmental interventions/aspects within an environmental impact category [DE HAES/HOFSTETTER 1994]. This step results in environmental performance indicators.

Characterization Factor

A factor that describes the relative harmfulness of an environmental intervention within one environmental impact category. A factor is a result of modeling environmental effects/problems [HEIJUNGS et al. 1992].

Classification

Classification attributes are environmental interventions/aspects listed in an

320486 PDF

Environmental Policy
4.2

Section I

"Environmental Policy" from NSF Guide

"Creating an Environmental Policy" from EPA IEMS Guide

"Establishing an Environmental Policy Statement" from NSF Metal Finishers Guide

"Environmental Policy" from Colleges & Universities EMS Guide

"Develop Policy/Preliminary Sign-Off on the Policy" from First Environmental

Section II "Commitment and Environmental Policy" from Ellipson

Purolater Products Environmental Policy Statement

SIA Environmental Policy Statement

International Paper Environmental Policy Statement

Nortel Networks Carrier Solutions Environmental Policy Statement

Uniroyal Chemical - Gastonia Environmental Policy Statement

Bridgestone/Firestone Environmental Policy Statement

City of Eugene, Oregon Wastewater Treatment Plant Environmental Policy Statement

City of Seattle, Washington Environmental Management Program Statement

Mayville Metal Products Environmental Policy

City of Gastonia, North Carolina Wastewater Treatment Division Environmental Policy

Alcoa - Mt. Holly Environmental Policy

Alumax Inc. of South Carolina Environmental Policy Statement

Tufts University Environmental Policy Statement

Brevard Community College Environmental Policy Statement

University of Massachusetts - Lowell Environmental Policy

University of Missouri - Rolla Environmental Policy

NEO Industries Environmental Policy Statement

Pacific Gas & Electric Company Environmental Policy Statement

Campbell & Co. Environmental Policy Statement

Village of Chelsea, Michigan - Statement of Environmental Policy

Saint Joseph Mercy Hospital Environmental Policy

Naval Aviation Depot North Island, San Diego, California Environmental Policy

United States Postal Service Environmental Policy

Virginia Department of Environmental Quality Environmental Policy

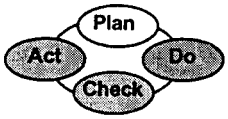
Epson Portland, Inc. Environmental Policy

Rejuvenation Inc. Environmental Policy

Wacker Siltronic Corporation Environmental Policy

Comments:

Comments:



Environmental Policy

Communicating your environmental vision

Key Policy Commitments:

- ☑ Continual improvement
- ☑ Pollution prevention
- ☑ Compliance with relevant laws and regulations

An environmental policy is top management's declaration of its commitment to the environment. This policy should serve as the **foundation** for your EMS and provide a **unifying vision** of environmental concern by the entire organization. Given its importance, your policy should be more than just flowery prose.

Since it serves as the framework for setting environmental objectives and targets, the policy should be **brought to life** in your plans and deeds. Everyone in the organization should **understand** the policy and what is expected of them in order to achieve the organization's objectives and targets.

Your policy should reflect three key commitments *(see box)*, including a commitment to **continual improvement**. While this does **not** mean that you must improve in all areas at once, the policy should drive your organization's efforts to continually improve environmental management (and the improved performance that results from these efforts).



Sample environmental policies are provided in the ***Tool Kit*** *(see Appendix A).*



Hints:

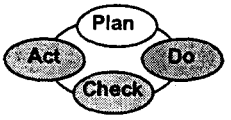
- Your organization probably has some type of environmental policy now, **even if it's not written down.** For example, your organization probably is committed to complying with the law and avoiding major environmental problems, at a minimum. Document existing commitments and goals as a starting point.
- The policy should relate to your products and services, as well as supporting activities. Consider the results of your **preliminary review** (see Section 3) and your analysis of the **environmental aspects** of your products, services and activities before finalizing the policy. These two steps can provide insight as to how your organization interacts with the environment and how well it is meeting its challenges. For example, information obtained during the preliminary review might help you define specific policy commitments.
- Keep your policy **simple and understandable.** Ask yourself: What are we trying to achieve? How can we best communicate this to the rest of the organization? One test to use: Could our employees describe the intent of our policy in twenty words or less?

Continual Improvement:

"Process of enhancing the environmental management system to achieve improvements in overall environmental performance in line with the organization's environmental policy."

ISO 14001

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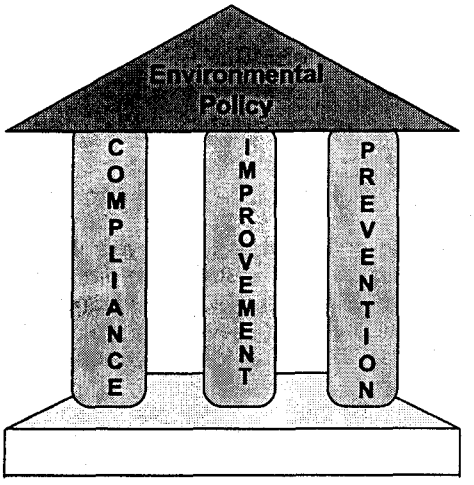


Figure 4: Three Pillars of an Environmental Policy



- ***Environmental Aspects***
- ***Objectives & Targets***
- ***Training & Awareness***
- ***Communication***
- ***Management Review***

- The environmental policy should be **explicit enough to be audited.** If you choose to use phrases such as "We are committed to excellence and leadership in protecting the environment", consider how you would demonstrate that 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 who should be involved in **developing the policy** and the best process for writing it. Input from a range of people within your organization should increase commitment and ownership.

- Make sure that your employees **understand** the policy. Options for communicating your policy internally include posting it around work sites (e.g., in lunchrooms), 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 from time to time by asking employees what the policy means to them and how it affects their work.

- The policy also should be communicated **externally.** Some options for external communications include placing the policy on business cards, in newspaper advertisements and in annual reports, among other options. You might choose to communicate the policy proactively or in response to external requests (or both). This decision should be factored into your overall strategy for external communication (see later discussion under "Communications").

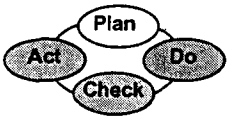
- Consider how you would **demonstrate** that you are living by the commitments laid out in the policy. This is a good test of whether or not the policy is a "living document".

For EPA's Performance Track program, an organization's policy must include:

- **compliance with legal requirements and voluntary commitments;**
- **pollution prevention (see Figure 5);**
- **continuous improvement in environmental performance, including areas not subject to regulation, and**
- **sharing information on environmental performance and their operation of the EMS with the community.**

For more information see Appendix B.

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Commitments to Compliance with Legal Requirements and Pollution Prevention

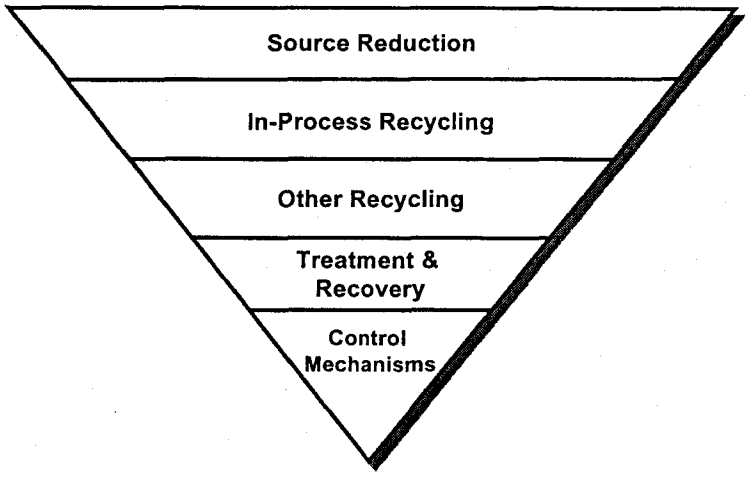
Compliance with legal requirements is a critical consideration in EMS development and implementation. EMS implementation requires an organization, among other things, to:

- develop and communicate an environmental **policy** that includes a commitment to compliance;
- develop and implement a procedure to identify, analyze and have **access to environmental laws and regulations**;
- set **objectives and targets** in line with its environmental policy, which includes a commitment to compliance;
- establish **management programs** to achieve its objectives;
- **train employees** and **communicate** relevant EMS requirements to them;
- establish and implement **operational control** procedures;
- establish and implement a procedure for **periodically evaluating compliance**; and
- establish and implement a procedure to carry out **corrective and preventive actions**.

While the requirements noted above relate directly to an organization's management of legal requirements, each of the seventeen EMS elements described in this Guide can contribute to enhanced compliance (including communication, documentation and document control, records management, EMS audits, and management review). An EMS that includes the elements described in this Guide will help your organization improve or maintain its compliance performance and facilitate the establishment of objectives and targets that go "beyond compliance."

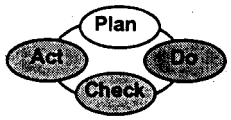
Figure 5

Prevention of Pollution Hierarchy



EMS design and implementation also should take into account the **Pollution Prevention** (P2) **hierarchy**. In evaluating P2 opportunities, organizations should start at the top of the pyramid (i.e., source reduction) and work their way down as needed to define the most appropriate methods for preventing pollution. Examples and best practices of P2 in operation are provided throughout this Guide.

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Capture the Learning: Environmental Policy Worksheet

Do we have an **existing policy?** If yes, how was the policy **developed?** When was the policy last **reviewed?**	
Does the policy reflect the **three key commitments** (commitments to compliance, prevention of pollution and continual improvement?) What **other commitments** does or should our policy contain?	
How does our policy take into account the environmental attributes of our **products, activities and services?**	
How would we **demonstrate conformance** to our policy?	
How is the policy **communicated** to our employees? Do our employees **understand** the critical elements of our policy? How do we know?	
What **feedback** have we received on the policy (from employees, contractors or other interested parties)? What happens when we receive feedback on the policy?	
How do we make our policy **available to external parties?** Is this process effective?	
Our next step on environmental policy is to ...	

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MODULE 2: CREATING AN ENVIRONMENTAL POLICY

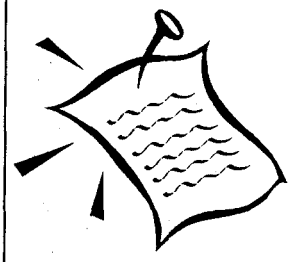
This module will help you review your company's current methods for managing environmental concerns, develop an environmental policy for your company, and determine the scope of your IEMS. Sample environmental policy statements are presented at the end of the module.

Understand How Your Company Currently Manages Environmental Concerns

This step is designed to help you review how your company currently handles environmental and human health concerns and compares current practice with where you would like to be. In some references, this is called a "gaps analysis" because it is designed to uncover ways to improve your management of these concerns. This step is best developed through discussions with groups of employees representing different functions in your company, *especially line managers and line workers*. You'll need to involve people that have the day-to-day working knowledge of your company's operations. It is important for everyone to understand what the IEMS involves and why it is being implemented. In this way, they can then explore alternatives to your current practices, so as to improve both environmental management and cost savings for your company. It will be helpful to keep a list of answers for future reference.

Discussion Questions

1. Does your company have an Environmental, Health & Safety Policy?
   - Is this policy written down?
   - Where is it located?
   - How many employees know about this policy?



☞ **Tip**

Your discussion should be comprehensive and detailed enough to give you some idea of what will need to be done to develop an IEMS for your company.

Principles that can be a part of your environmental policy include a commitment to risk reduction, pollution prevention, and wise resource management.

☞ **Tip**

The **environmental policy** is the foundation of the company's IEMS. Through it, top management should communicate goals such as preventing pollution and minimizing risk to workers and the environment.

- How did they learn of it? Is it included in a training or orientation program?
- Do employees have the opportunity to make suggestions regarding environmental concerns?
- What points are included in this policy?

2. Does your company have specific environmental or health & safety goals?

- Are these documented?
- How are these communicated to employees?
- Is there a way of tracking whether goals are met?
- Are there penalties within the company for not achieving the objectives?
- Is there a way to change these goals when changes in processes, production, or activities occur? How are these changes communicated?

3. Does your company have a process to identify all environmental, health & safety regulatory requirements?

- Has your company conducted compliance audits?
- Has your company received any fines or penalties requiring corrective action?

☞ Tip

Remember to consider worker health and safety, as well as people outside your plant, when evaluating known health concerns.

☞ Tip

The EPA National Enforcement Investigations Center (NEIC) has recognized the way in which an EMS improves a company's compliance record by providing a guidance document for developing a "compliance-focused" EMS. (See Appendix G for more information.)

- Has your company experienced difficulties in complying with regulations?
- Are some regulations difficult/costly to meet?
- Does your company know whom to contact at local, state, and federal regulatory agencies in the event of environmental accidents or compliance concerns?
- Does your company have a mechanism for staying up to date on changing regulations?

4. How does your company evaluate risk to human health & safety and the environment caused by your business operations? How is this information incorporated into planning for business activities/production?

5. Is there a process within the company to review any changes in products or processes with an eye toward environmental concerns?

6. Are there policies and procedures regarding procurement and contracting that consider environmental concerns?

7. What training is offered at your company that would support environmental objectives?

- Do employees receive environmental, health & safety training? What percent of employees? Which ones?
- How is that training documented? Where are the records kept?
- Is there provision for regular training on environmental, health & safety requirements?

8. Does your company have a procedure for responding to suggestions regarding environmental concerns that it may

☞ **Tip**

Reviewing these questions in six months and, again, in one year provides a good way to track progress in developing your IEMS.

receive from customers, neighbors, or employees?

- Is there a process for soliciting and recording any "suggestions"? Where are these records kept?
- Is there a process for following up on any of these suggestions to be sure that appropriate action was taken?

9. How does your company keep track of its documents?

- Is there a filing system?
- How many people are familiar with the system?
- How many people have access to it?
- How could someone find information relating to environmental, health & safety concerns? Are there Material Safety Data Sheets (MSDS) available? Does your company have documented standard operating procedures for plant operations, emergencies, or document control?
- How are decisions made about when to dispose of documents?

10. How does your company identify potential accidents or emergency situations?

- Are emergency procedures documented?
- How do employees find out about them? Is there regular training?
- Are these procedures periodically tested, evaluated, and revised as needed?
- Have there been failures in response to accidents or emergency situations?
- Is there a communications plan in place in the event of emergencies?

11. Does your company have a way of measuring the

☞ Tip

As you discuss these questions, it will be beneficial to write down the answers for reference as you proceed with the following modules.

☞ Tip

You should review this policy statement as you complete the modules following this one to determine whether changes need to be made.

environmental effects of any of its operations?

- Are there records kept?
- How long?
- Are these records reviewed regularly with an eye to whether performance has improved or worsened?

12. How does your company track its environmental costs?

- Does your company track environmental costs such as on- and off-site waste handling and treatment?
- Does your company track regulatory compliance costs such as labor costs for labeling, manifesting waste and/or permitting, and record keeping?
- When purchasing materials and supplies, does your company consider things like handling costs, OSHA training, and shelf life?
- Are the above costs allocated to overhead accounts or traced to products or activities?

Internet Help

Visit the DfE website for more tools related to gaps analysis:

www/epa.gov/dfe

Environmental Policy Statements

An environmental policy is your declaration of commitment to the environment and worker health and safety. This policy serves as the foundation for your IEMS, and provides a unifying vision of environmental principles that will guide the actions of employees and management. This policy statement serves as the framework for setting environmental objectives and targets, and will be brought to life in your plans and business activities. Consider the scope of your environmental policy statement for that will also determine the scope of your IEMS.

Refine Your List of Issues

Review the environmental aspects identified in Module 1. Make a list of general environmental concerns that could be addressed in your company's environmental policy statement.

Set Your Boundaries

Think also about the scope of your policy. Decide whether it will include activities beyond internal operations, such as supplier environmental performance or customer product use. Remember to consider the company's property beyond plant walls up to the "fenceline." Consider how to include contractors working at your site, and consider companies you use for outsourcing. You will want to drop issues from your list that do not fall within the boundaries set for your policy statement. As you begin your IEMS, you may want to define your boundaries within the company. As you gain experience, you may choose to expand the scope of your IEMS to include environmental issues important to your customers and suppliers.

Draft Your Environmental Policy Statement In General Terms

Address your list of specific issues in general terms in your policy statement. For example, if chemicals in your water or air are a concern because they potentially impact the community, you could express a commitment to review and, where feasible, make changes in the chemicals used by your company, or make sure you are managing them appropriately. Or, if solid waste in landfills is a concern in your area or to your company, you could express a commitment to reduce the solid waste your company produces.

Next, think about *how* to put commitments into action. For example, your commitment to reduce solid waste may be achieved through a pollution prevention program and/or a program to design products or services that result in minimal waste generated by the consumer. Also, these programs may be implemented one at a time over a several-year period, as part of your commitment to continuing improvement.

Sample Policy Commitments

It is important to think through which commitments your company will be capable of addressing. Do not include commitments in your policy that the company will not be able to carry out. The following is a checklist of commitments or principles that you may wish to consider including in your policy statement:

- Comply with applicable environmental or worker safety laws/regulations.
- Work to achieve pollution prevention.
- Prevent accidents.
- Identify opportunities for risk reduction associated with the processes and chemicals used in your plant, the supplies procured, the products produced, and the disposal of waste products.
- Consider the life cycle (from raw materials extraction and processing to use and eventual disposal) of products produced, including packaging, so as to affect how suppliers and end users impact the environment through your products.
- Continue improvement in your use of cleaner technologies and processes, and in the safer use of chemicals.
- Practice wise resource management, including conservation of limited resources and reuse and recycling of materials.
- Consider which goals of industry or your trade association could be adopted for your environmental policy statement.

Make sure top management commits to the environmental policy statement. If possible, the company president should sign and date it. The final environmental policy statement should be posted or distributed to employees and other interested parties.

Resource 

Review the *Company Manual Template* for examples of how to document your policy.

Examples

The following are sample environmental policy statements that in some way incorporate most of the principles listed above.

YOUR COMPANY (ABC)
HEALTH, SAFETY AND ENVIRONMENTAL POLICY

This is a sample policy. Adapt for your company.

ABC Company is committed to managing health, safety and environmental (HS&E) matters as an integral part of our business. In particular, it is our policy to assure the HS&E integrity of our processes and facilities at all times and at all places. We will do so by adhering to the following principles:

COMPLIANCE

We will comply with applicable laws and regulations and will implement programs and procedures to assure compliance. Compliance with HS&E standards will be a key ingredient in the training, performance reviews, and incentives of all employees.

RISK REDUCTION, PREVENTION, RESOURCE MANAGEMENT

We will seek opportunities, beyond regulatory compliance requirements, for reducing risk to human health and the environment, and we will establish and meet our own HS&E quality standards where appropriate.

We will employ management systems and procedures specifically designed to prevent activities and / or conditions that pose a threat to human health, safety, or the environment. We will look for ways to minimize risk and protect our employees and the communities in which we operate by employing clean technology, including safe technologies and operating procedures, as well as being prepared for emergencies.

We will strive to minimize releases to the air, land, or water through use of cleaner technologies and the safer use of chemicals. We will minimize the amount and toxicity of waste generated and will ensure the safe treatment and disposal of waste.

We will manage scarce resources, such as water, energy, land, forests, in an environmentally sensitive manner.

COMMUNICATION

We will communicate our commitment to HS&E quality and to our company's environmental performance to our employees, vendors, and customers. We will solicit their input in meeting our HS&E goals and in turn will offer assistance to meet their goals.

CONTINUOUS IMPROVEMENT

We will measure our progress as best we can. We will review our progress at least on an annual basis. We will continuously seek opportunities to improve our adherence to these principles and to improving our environmental performance, and we will periodically report progress to our stakeholders.

{Signature} President Date

Adapted from: *Environmental Management Systems: An Implementation Guide for Small and Medium-Sized Organizations.* Ann Arbor, MI: NSF International, November 1996, p.3.

SAMPLE POLICY

This is the environmental policy of a small environmental services company specializing in wastewater treatment and laboratory analysis of effluent. The policy should be signed by the company's President.

We supply quality products and services. This requires the commitment of everyone working in this institution to pursue our activities safely, protecting our health and preserving the environment.

To realize this vision we will:

- Establish and review periodically our environmental goals within a program of **continual improvement**.
- Comply with legal requirements pertinent to our industry and with the requirements of other initiatives we enter into in accordance with our commitment to offer quality products and services.
- Conduct laboratory analyses and supply environmental services without risk to workers' health.
- Operate the laboratory with a minimum of waste, in current and future operations.
- Pursue our work with a minimum of disturbance to our neighbors and the community.
- Maintain our vehicles in optimal condition to minimize their consumption of fuel and their emissions to the atmosphere.
- Manage our chemical products safely, principally to prevent spills in their storage and transport.

This policy and any subsequent modifications should be familiar to all employees and available to the public. Implementation of this policy is a primary objective of the President and the responsibility of all employees.

{Signature} President Date

CASE STUDY: COPY PLUS SERVICES

Sam Worth, owner of a copy center business, was attending a conference on issues affecting small businesses. The conference was the first of this type that Sam had attended. His business, Copy Plus Services, has five centers located in the western suburbs of Chicago. Each center provides a full range of copy services including fax, binding, computer usage, video conferencing, and blueprint service. The centers are run 24 hours a day and seven days a week. Sam grew the business from a simple copy center located in Elgin, Illinois, five years ago and is planning to go national with the business.

During one of the small group sessions, Sam and five other attendees were discussing how their businesses affected the environment. One of the presentations had mentioned a new standard — ISO14001 Environmental Management Systems — which applies to service businesses as well as manufacturers. None of the people in Sam's small group was familiar with the standard. They decided to share with one another what they'd been doing in their businesses to protect the environment and then review the ISO 14001 standard.

Naturally Sam's five copy centers recycled waste paper. However, beyond that Sam had never thought of other environmentally conscious programs that they could implement. He was a bit embarrassed that he had not really given it much thought. He has had complaints of odors bothering the people in stores adjacent to his centers. In an attempt to appear as if he had given it some thought, Sam told the group that he had a good quality program which he thought addressed environmental issues, and that one of his centers had received an ISO 9001 quality award for doing quality work.

For the most part, the other members of the group had also not given environmental programs much thought. They didn't have any specific issues confronting them and were somewhat concerned about embarking on a program for which they could not see any beneficial return and that might be a big cost to the business. Since they had never dealt with the EPA, they were leery of the possibility that EPA might come into their business if they participated in the ISO 14001 program.

One of the group members said that, from what she had read on environmental programs in *Business Week*, there were benefits to be derived by undertaking such a program. Since these programs had to be integrated into the overall business plan, it seemed important that top management provide the leadership in incorporating environmental stewardship. She cited some examples of this from case studies she had read, as well as from her personal experience. One of the examples was an ice cream business in Chicago, which increased its overall productivity by focusing on energy efficiency. In addition, an international clothing distributor used the environment as a major selling point for its product.

After Sam returned home from the conference, he sat down and thought about what had been discussed in the small group session. He wanted to start an environmental program in his business but was not quite sure how to proceed. He decided to draft an environmental policy for his Copy Plus Service before going to bed, and present it to his staff at their weekly meeting the following Tuesday.

At the meeting Tuesday, Sam presented his environmental policy to his staff. Sam's staff was composed of the managers of the five centers, a finance manager, and himself.

The reaction from the group was split. Two of the managers felt that, other than recycling the paper, there wasn't anything of significance that they could do within their business. The other three seemed to think that this was something worth pursuing. The finance manger was on the fence. While she acknowledged that there might be some ideas for them to pursue, she was concerned that it would add cost to the business. The copy business was a low-margin business and competition was increasing.

Although Sam knew that everyone wasn't equally committed, they all agreed to pursue the idea further. The finance manager and the two managers who were enthusiastic would review Sam's environmental policy to determine whether it was appropriate for the business. If so, they would help figure out how it could be incorporated into the business. Sam suggested that they might want to talk with someone else in the copy business to see what they are doing about environmental programs. The finance manager said that she knew someone from The Body Shop, also in the mall, who had worked on a committee to develop their environmental program. They all agreed that the friend should be invited to join them for a meeting as an outside observer and advisor.

☞ Tip

Sam may have had a better response if the managers had all participated in developing the policy together.

When the three managers met, Laura Witherspoon from The Body Shop, a neighboring store in one of the malls, was able to attend. She agreed to provide her perspective and ideas in establishing an environmental management system. The first order of business was for them to explain their operation to her.

☞ Tip

So far Sam has only involved managers. He should now include employees from all levels of the company.

Copy Center Operations

Each copy center produces a million copies per year using premium grade paper. Of that output, 70% is single-sided copies. Each copy center also does a significant amount of blueprint business. There are fifteen employees per center. Each center's energy bill is $50,000 per month. The majority of the work is done during 9 AM to 6 PM business hours. They recycle approximately 100,000 pieces of paper per year in each center. Each center uses 400 toner cartridges and two gallons of ammonia per month. Supplies are stored on shelves in a back room and chemicals are stored either in metal cabinets or next to the machines (for easy access). Copy Plus Center customers come both through newspaper advertising and pamphlets, and through their Web site.

Equipment: The copy machines and computers are three to five years old. They are typically left on 24 hours a day. The managers are not sure if any of the chemical products used in the copy and blueprint equipment have an impact on the environment.

Location: The Copy Plus centers are in shopping malls and residential areas. Businesses in the area such as restaurants have expressed concern over the odors coming from the centers.

Delivery Service: Each center has vans providing customer pickup and delivery. In addition, the vehicles are used to pick up supplies for the centers.

Cleaning Service: Each center contracts with a cleaning service that cleans the facilities. A waste disposal company handles the waste, and recycling is subcontracted.

Training: Employee training focuses on running the equipment and administrative procedures, including paper recycling.

Considering this information, Laura suggested that they approach environmental management system implementation not just from the standpoint of the copy center operation but from a total systems approach. Laura presented a simple input/output model to begin the process of understanding the environmental aspects of the business. The three managers immediately recognized the possibility and benefits of this approach. They asked Laura if she would be willing to prepare a rough plan that described this approach in more detail, and outlined a typical copy center environmental management system. Laura agreed because she remembered how difficult it was to get the synergy in her own organization. She felt that she could assist them with this.

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2.1 Establishing an Environmental Policy Statement [ISO 4.2]

What the ISO Standard Requires

The ISO 14001 Standard requires that top management define the environmental policy. The scope of the policy should be appropriate to the nature and scale of the business, and it should cover environmental impacts resulting from the company's activities, products and services. In addition, the policy statement should include the "three pillars": (1) commitment to continual improvement, (2) commitment to prevention of pollution, and (3) commitment to compliance with applicable environmental legislation and regulations and with other requirements to which the company subscribes (for example, the CSI Metal Finishing Strategic Goals Program). The environmental policy statement provides the framework for establishing and reviewing the environmental management program's objectives and targets. The policy statement must be documented and must be implemented and maintained. It must also be communicated to all employees, and made available to the public.

Starting Points

About half of the companies had previously existing environmental policy statements (one had one in place for over 10 years), although none of these statements met all of the requirements of the ISO 14001 Standard, including especially the commitments to continual improvement, prevention of pollution, and compliance.

Implementation Tips

1) Strive to complete the implementation process, not to perfect the system from the beginning. The EMS you implement doesn't have to be perfect from the start, but it does need to include the major elements described in this Guide. Your policy of "commitment to continual improvement" requires you to pay attention to improving the EMS—determining how well it is functioning, and what needs to be changed or improved. System level procedures, such as Auditing, Preventive and Corrective Action, and Management Review, are intended to act together to create the conditions for identifying problems with the management system and fixing them.

2) Consider your first policy statement to be a draft. Include a process for revising it at towards the end of the EMS implementation process.

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Companies have a tendency to get too attached to early versions of a policy statement. They may spend a lot of meeting time getting consensus among various groups and managers in the company as to the exact wording of the statement. However, when they have completed the EMS implementation process, they may find that this early version of the policy statement needs revision. The policy statement may include phrases that are difficult to implement, or it may miss significant components of the environmental management program that have been added (for example, energy efficiency programs, community education and outreach programs, or programs to reduce the use of toxic materials).

3) Integrate the environmental policy with other company policy statements. Consider integration of the policy statement with other company policy statements, such as Quality, or Health and Safety. The Environmental Policy should fit well with existing company policy, so it helps if it follows a similar format and framework. For example, many companies have existing Quality Policy statements. The Environmental Policy statement could be worded and documented in a similar fashion.

4) Develop a short summary of the policy to use in communication about the EMS. In order to effectively communicate the policy statement to all employees, consider writing a short summary statement that covers the key points of the environmental policy. This statement should be included in the Environmental Policy documentation.

Examples

1) Documentation: Several companies included the policy statement within the framework of an EMS procedure. The procedures typically included the purpose, scope, references and definitions, as well as the Environmental Policy statement itself. This framework makes the documentation part of the overall EMS documentation. Other companies simply issued a separate Environmental Policy document (appropriately signed and dated), which would be suitable for distribution for the public.

2) Commitment to the Three Pillars: Most companies explicitly stated the three pillars simply by committing to 1) prevention of pollution; 2) compliance with applicable environmental regulations; and 3) continual improvement of the EMS. Some were more specific about types of pollution as in the following example:

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> The primary objective of XYZ Plating is to preserve the environment by designing the operations in ways that reduce the use of hazardous substances, generate minimal amounts of waste, and reduce adverse impacts on the environment. We will comply with all environmental laws and regulations that apply to our operations. We will work continuously to improve the effectiveness of our environmental management.

3) Include a statement that indicates how the policy sets the framework for establishing and reviewing objectives and targets. One example of this:

> XYZ Plating will seek to prevent pollution before it is produced and reduce the amount of raw materials used, as well as the amount of waste at our facilities, in an environmentally sensitive manner. We will reduce the amount and toxicity of the waste generated, and will ensure the safe treatment and disposal of such waste.

4) Communication

Most companies simply specified that the policy would be communicated to employees and the public without specifying the means of communication.

> XYZ will communicate its commitment to environmental responsibility to its employees, customers, vendors, and the community.

Conformance Check

1) Nonconformances: The environmental policies reviewed showed nonconformance in two areas. One policy showed no evidence of being a controlled document. This is an example of where recognizing the links in your EMS is important. Section 4.4.5, Document Control states that "all documents required by this International Standard..." are to be part of an established document control system. The environmental policy falls in that category. Another policy included commitment to compliance and prevention of pollution but overlooked commitment to continual improvement of the EMS.

2) Going Beyond Requirements: Most of the metal finishers framed their environmental policy statement around the "three pillars of an EMS policy:" 1) commitment to continual improvement, 2) commitment to prevention of pollution, and 3) commitment to comply with environmental laws and regulations. Several of the policy statements went beyond conformance to standard requirements. For example:

"Continual Improvement: A commitment to continuously improving our EMS, *our compliance record, and our prevention of pollution in all areas of our business.* " (Emphasis added)

"We will continue to strive for continuous improvement of our *environmental performance*" (emphasis added)

It is important to note that the standard requires continuous improvement of only the EMS, not environmental performance, which is much broader in scope and more difficult to sustain. It is not wrong to go beyond the requirements of the standard but when it comes to the policy, the foundation of your EMS, be cautious in what you claim. Here are other examples:

"We promote cooperation and coordination between industry, government, and the public toward the shared goal of environmental protection."

"We are committed to excellence and leadership in protecting the environment."

Grand, sweeping statements such as these can be a flag for an auditor (either your internal EMS auditor or a registrar) to ask for evidence of how you meet your policy commitments. If your company does not intend to actively "promote coordination with the public," or make the investment to be a leader in protecting the environment, do not include such statements in your policy, no matter how good they sound.

3) Communication: Half of the policies reviewed included "Communication" as a major objective of the EMS along with commitments to compliance, continuous improvement, and prevention of pollution. In addition to communicating the policy to employees (which is a requirement), these policies included communication of the policy to customers, vendors, contractors, consultants, the community, and other interested parties. While the standard requires that the policy be made available to the public, it does not require that your policy be proactively communicated or that you disclose environmental performance information. While it is fine

to go beyond standard requirements, in an EMS audit, nonconformance with a self-imposed requirement carries equal weight to a nonconformance with a standard requirement.

4) Added Features: One policy included the signatures of all key management positions in the company, President, Operations Manager, VP Sales, Quality and EMS Manager, Plant Operations Manager, Office Manager, and Controller. This helps to demonstrate management awareness and support of the EMS. In several cases, the policy was part of a procedure that included a scope statement, and listed responsibilities for implementation, revision, and communication of the policy.

EMS Links

- Environmental aspects: This link is indirect. The standard requires that the policy provide the framework for setting and reviewing objectives and targets. An organization's significant aspects are one consideration in determining objectives. Thus, a change in an environmental aspect may change an objective, which in turn may necessitate a change in the policy.

- Legal and other requirements: The requirements in this section support commitment to comply with regulations.

- Objectives and targets: The connection between this section and the policy is important to recognize. Your objective and targets should reflect a commitment to the prevention of pollution as described in your policy.

- Training, awareness, and competence: The policy is a key component of your environmental training. For example, employees should be knowledge of the policy, understand its importance, and know their role in achieving conformance to the policy.

- Communications: Communicating the standard to the public may be a part of an organization's process for managing external communications.

- Document control: The environmental policy should be a controlled document.

- Operational controls: Companies often overlook the link between operational controls and the policy statement. The policy will help a

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facility determine which of its operations fall under operational control requirements.

- Monitoring and measurement: The requirement to periodically evaluate compliance with regulations directly supports the commitment to compliance in the policy.
- Management review: One objective of the management review is to address the possible need for changes to the policy.

ELEMENT 1.1

ENVIRONMENTAL POLICY

The intent of an environmental policy is to define the organization's commitment to the environment through continual improvement in environmental performance. A strong, clear environmental policy can serve as both a starting point for developing the EMS and a reference point for maintaining continual improvement. The policy should be evaluated regularly and modified, as necessary, to reflect changing environmental priorities.

At C/Us, the policy should function in two ways: (1) within the C/U (faculty, students, and administrative, operations, maintenance, physical plant, and faculty employees), the policy should focus attention on environmental issues associated with activities and services; and (2) outside the C/U (regulators and community) the policy is a public commitment to addressing environmental issues and continually improving environmental performance.

The environmental policy should, at minimum, address the following three topics:

- Commitment to compliance with applicable environmental legislation and regulations
- Pollution prevention
- Continual improvement

Tips for Developing an Environmental Policy:

1. **Incorporate Multiple Perspectives:** Develop a policy that reflects input from various perspectives; for example, chancellor/dean, department head, faculty, students, community members, and C/U staff (environmental, maintenance, operations, etc.).
2. **Develop A "Marketing Plan:"** Include discussion of how to make people aware of your policy as part of the policy development effort. Make a list of groups and individuals to whom you want to distribute the policy and then match the media and method to the audience. Specifics of the policy dissemination should be described in Element 3.2, Communications. The policy should be easily available and translated into languages other than English, as appropriate.
3. **Demonstrate C/U Administration Commitment:** The importance of top management commitment to the environmental policy cannot be overemphasized. It is the cornerstone of success for the EMS. Solicit input and commentary from your C/U administration and include their signatures on the policy to demonstrate understanding and commitment.

	EMS ELEMENT	SCORE	C/U-EMS TEMPLATE ELEMENT
4.2	Are records appropriately retained?		4.4
4.3	Are processes in place where support the collection of information to determine compliance with applicable environmental laws and regulations?		2.2, 4.1
4.4	Is collected information analyzed to identify deficiencies and areas of concern?		
4.5	Are corrective actions developed to prevent future issues, in addition to correcting the immediate problem?		4.3
4.6	Are recommended and/or required corrective actions verified for implementation and evaluated for effectiveness?		
4.7	Is the checking and corrective action program evaluated for effectiveness?		
	Subtotal (total maximum points = 21)		
5.0	**ADMINISTRATION REVIEW**		
5.1	Has top management reviewed the EMS?		4.6
	TOTAL SCORE (33 questions and a total of 99 points)		

Implementation: *Procedure 1.1, Environmental Policy* describes the process and identifies the participants developing the environmental policy. Use the example policies provided as tools for this element to guide drafting of a policy that reflects the scope, intent, and commitment of your C/U.

SAMPLE PROCEDURE ONLY – REVISE AS NEEDED

[C/U Name]	EMS Procedure	1.1
	Effective Date	
	Subject	**Environmental Policy**

Purpose This procedure is used to develop and write the [C/U Name] environmental policy.

Step 1 The EMS Manager will form a policy development team responsible for developing and writing a draft environmental policy. The draft policy will address, at a minimum, compliance, pollution prevention, and continual improvement.

Step 2 The policy development team will review relevant documents to ensure consistency with other [C/U Name] policies and solicit, as appropriate, faculty, students, staff, [C/U Name] administration and the community as well as other institutions' policies to guide the content and phrasing of the policy.

Step 3 The EMS Manager will address comments and finalize the policy and then obtain signatures, including top administration officials.

Step 4 The policy will be available to [C/U Name] faculty, students, staff, and the community and the policy will be available in languages other than English, as appropriate. The specifics of policy dissemination will be described in *Element 3.2, Communication.*

Step 5 The EMS Manager and policy development team members will review the environmental policy at least annually, and update it if needed.

Responsible Person: _____

Signature and Date: _____

4. DEVELOP POLICY / PRELIMINARY SIGN-OFF ON THE POLICY

Your environmental policy establishes and validates top management's commitment to the environment. The environmental policy places responsibility on top management for implementing the environmental program and reviewing performance against policy. The environmental policy should recognize that all activities, products or services can impact the environment.

Consider the following when developing the policy:

Your organization's mission, vision, core values and beliefs (guiding principles and internal standards)

Requirements of and communications with interested parties (stakeholders)

Continual improvement***

Prevention of pollution***

Guiding principles

Coordination with other organizational policies (e.g. quality)

Specific local or regional conditions

Compliance with relevant environmental regulations, laws and other criteria to which your organization subscribes***

*** Must be addressed in the policy.

Ask the following questions throughout policy development:

Do you have a policy that is relevant to your activities, products and services?

Does the policy reflect your organization's values and guiding principles?

Will the policy be approved by top management and has someone been identified and given the authority to oversee and implement the policy?

Does the policy guide the setting of environmental objectives and targets?

Does the policy guide your organization towards monitoring appropriate technology and management practices?

What commitments are embodied in the policy?

Consider these additional development/implementation tips:

Address the three required commitments

Decide how broad or narrow your commitment to continuous improvement will be

Decide how broad or narrow your commitment to prevention of pollution will be

Decide how to word your commitment to compliance with relevant environmental regulations and other requirements

Consider statements relating to policy implementation, maintenance and communication.

Review draft policy and solicit comments/opinions

Revisit issues and revise as necessary

Have top management sign off on the policy

Set up and document procedures for deploying the policy (communication, availability, responsibility, review)

5. DEFINE "SIGNIFICANCE"

ISO 14001 requires that you establish and maintain a procedure to identify the environmental aspects of your activities, products and services "...in order to determine those which have or can have significant impacts on the environment." Being able to identify the significant environmental aspects of your activities, products and services is a requirement to meet other ISO 14001 provisions. The significance of your aspects and impacts will depend on a variety of considerations related to your business and its environmental issues.

Develop a framework for determining "significance"

Decide which criteria are relevant to your activities, products and services

Develop a rating system to grade aspects/impacts

May Include the following considerations or others as appropriate:

Environmental concerns:

Scale of the impact

Severity of the impact

Probability of occurrence

Duration of impact

Business concerns:

Potential regulatory and legal exposure

Difficulty of changing the impact

Cost of changing the impact

Effect of change on other activities and processes

Concerns of interested parties

Effect on the public image of your organization

Develop a "Significance" Matrix Model

6. DEVELOP A PROCESS TO PRIORITIZE SIGNIFICANT ASPECTS/IMPACTS

Your organization must work within budget constraints, and as such not all aspects can be addressed at once.

Develop process to prioritize and choose which "significant" aspects and impacts will be addressed

Conduct cost/benefit analyses

Include a process for identifying significant aspects to be addressed in the future

3 Implementing an Environmental Management System

3.1 Commitment and Environmental Policy

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- Getting the Commitment 20
- Initial Environmental Review 21
- Drafting the Environmental Policy 21
- Environmental Policy Statement 24

3.1.1 Introduction

An environmental policy is a statement of the organization's overall aims and principles of action with respect to the environment, including compliance with all relevant regulatory requirements. It is a key tool in communicating the environmental priorities of your organization to employees at all levels, as well as to external stakeholders. As such, it should be written clearly and concisely to enable a layperson to understand it, and should be made publicly available. It is up to the organization to decide on environmental priorities based on an initial environmental review, but these choices should be justified in the policy. To be truly effective the policy should regularly be reviewed and revised and incorporated into the organization's overall corporate policy. The policy statement should set in writing a few achievable quantifiable priorities related to the environmental management system and the significant environmental effects found at the work-site. Furthermore, EMAS requires that the most signifcant environmental effects be mitigated within three years. Some form of improvement must also be accomplished from year-to-year by the organization and must be shown in the annual reports.

Although the formulation of policies and clear priorities is the most important step of environmental management, this step is often neglected. Many top managers feel pressure to do something for the environment and thus embark on some form of „environmental activism", often containing many isolated activities but no clear direction. For an organization to be a credible and efficient environmental performer and to reap the benefits of being an environmental leader in its markets, the rationale for investing in environmental management must be very clear.

To ensure an organization's commitment towards a formulated environmental policy, it is essential that top management is involved in the process of formulating the

policy and of setting priorities. Therefore the first step is to get the commitment from the highest level of management. Based on this commitment the organization should then conduct an initial environmental review and draft an environmental policy. This draft should be discussed and approved by the board of directors. Finally, the approved environmental policy statement must be communicated internally and made available to the public.

3.1.2 Getting the Commitment

3.1.2.1 Getting the Commitment from the Highest Level

As the environmental policy establishes an overall sense of direction and sets the principles of action for an organization, it requires commitment from the highest level of management. Top management should be involved in the development and adoption of an environmental policy.

Getting the commitment from the highest level should be argued on the basis of costs and benefits and their impact on shareholder value (see chapter 1.5 on page 9). If the implementation of an EMS increases shareholder value it is easier for top management to commit themselves to approving an environmental policy and to implementing an environmental management system. This commitment includes three basic policy statements:

- Continuous improvement in environmental performance
- Compliance with environmental regulations
- Maintaining public relations regarding environmental issues of the organization, its activities, products and services

3.1.2.2 Commitement to Continuous Improvement

The central focus of the policy should be a commitment to continuous improvement. This means improvement in the EMS itself and a decrease in environmental impacts caused by an organization's activities, products and services. It is important for businesses to show improvement over time, both in environmental performance and in organizational commitment to this path.

3.1.2.3 Compliance with Environmental Regulations

A commitment to comply with at least local environmental regulations is a minimum requirement for all of the environmental standards. However, multinationals operating in various environments and facing different laws in each, should think about which laws to abide by and if it is feasible to adopt the same standard worldwide. Generally, laws in newly industrializing countries are lax as compared to industrialized countries. However, given the increase in interest

in environmental issues in these industrializing countries and the possible impact of the ISO 14000 series, it may be sound practice to adopt the more stringent laws in worldwide operations, where it is feasible to do so. In addition, the adoption of high standards worldwide can yield other benefits, such as an improved public image or easier technology transfer between different sites.

Companies should guard against going overboard in fulfilling environmental policies. Limits are in fact set on how far a company has to go to reduce its environmental impacts. Reductions do not have to exceed levels which can be achieved by economically viable application of the best available technology (BAT).

3.1.2.4 Commitment to Public Relations

Lastly, as a tool to communicate company intentions to the public, a commitment to public relations should also be part of the policy. While EMAS explicitly requires public disclosure, BS 7750 and ISO 14001 do so to a lesser extent, by requiring only that the policy be publicized.

3.1.3 Initial Environmental Review

An environmental review is an initial comprehensive analysis of the environmental management system and the issues, impacts and performance of activities at a site. The purpose of this initial review is to asses the current position of the organization with regard to the environmental management system and the impacts of a site's activities; such as choice of raw materials, types of waste generated etc. For more details about planning, conducting and reporting an initial environmental review, please refer to chapter 3.2 on page 25.

3.1.4 Drafting the Environmental Policy

The environmental policy is a written statement of the organization's overall aims and principles of action with respect to the environment, including compliance to all relevant regulations. It should steer clear of vague, over-ambitious statements, while clearly showing top management commitment to and support of environmental issues. The point of the statement is to provide a set of consistent guidelines to the organization to enable continuous improvement with regard to environmental issues. The issues addressed in the policy can vary from organisation to organisation, depending on its priorities.

Before drafting the environmental policy, the policy must be clearly relevant to the organization's activities, products and services and their environmental effects. In order to determine this, a complete review of operations is required. Based on this initial environmental review, top priorities and the policy direction for the organization is determined, given constraints of time and money. An

environmental policy is unique to an organization and as such should be written to fit a given organization's needs. There are no cut and dried rules to be followed. What is written below are general guidelines which can be followed. The environmental policy must fulfill the following requirements [HILLARY 1994, EMAS, ISO 14001, BS 7750]:

1. State the rationale for having an environmental policy
   (see chapter 1.5 on page 9)
2. Include a clear commitment aimed at (see chapter 3.1.2 on page 20):
   - 2.1. Continuous improvement
   - 2.2. Compliance with environmental regulations
   - 2.3. Maintaining public relations
3. Cover the main environmental issues a company is facing and set priorities amongst them
4. Define good environmental management practice
5. Define responsibilities and authority
6. Document and publicize the policy.

3.1.4.1 Main Environmental Issues to be Covered

The environmental policy should make a statement on the following environmental issues [EMAS], which can be divided into three main areas [TANEGA 1994, adapted]:

- Control
  - outputs
    - assessment, control and reduction of air pollution
    - evaluation, control and reduction of noise
    - assessment, control, reduction and re-useing of waste water
    - avoidance, recycling, re-use, transportation of waste
  - inputs
    - savings, choice and transportation of energy
    - savings of water
    - savings, choice and transportation of raw materials
- Planning
  - selection of new production technology, changes to existing production processes
  - design, packaging, transportation, use and disposal of new products
  - assessment of contractors, subcontractors and suppliers
  - prevention and limitation of accidents
  - contingency procedures for incidents

- Communication
  - internal education, training and communication
  - external communication and reporting

With regard these issues, the policy should set priorities according to the organization's specific situation. This can be done by evaluating the environmental exposure of the organization.

3.1.4.2 Good Environmental Management Practice

The draft of the policy statement should be done in a manner that is conducive to establishing good environmental management practices. These principles serve as a guideline for implementing the environmental policy and may include [EMAS, TANEGA 1994] the following:

- Fostering a sense of responsibility for the environment among employees at all levels.
- Conducting environmental impact assessment of current and new activities, products and services.
- Taking measures to reduce resource consumption and to prevent environmental impacts, taking into account clean technologies.
- Adopting measures to prevent accidents and to limit or remediate damage to the environment resulting from organization activities, products and services.
- Cooperating with public authorities to ensure that the contingency procedures to minimize the impact of any accidental discharges to the environment are established and updated.
- Establishing procedures to ensure compliance with environmental policy.
- Establishing procedures for corrective actions in case of non-compliance with regulations, environmental policy, objectives and targets.
- Maintaining an open dialogue with the public, providing appropriate information about the environmental impact of the organization's activities.
- Maintaining an open dialogue with the public, providing appropriate information to customers on the proper handling, use and disposal of products and services made by the organization.
- Making provisions to ensure that contractors working at the site apply environmental standards equivalent to the organization's own.

3.1.4.3 Responsibilities and Authority

The environmental policy should state the basic responsibilities and authority for enforcing the policy. More information is provided in chapter 3.4.2 on page 40. Questions to be answered in the policy include:

- Who is responible for implementing the policy?
- Who has the authority to enforce the policy?

As a basic rule, the responsibility for implementing and enforcing the environmental policy should be given to a representative from the highest level of management. The responsibility to achieve objectives and targets should be assigned to the line managers.

3.1.5 Environmental Policy Statement

Once the draft is finalized, approval for the environmental policy from top management (board of directors) can be secured. Once this step is completed the final environmental policy statement can be written. The format of the environmental policy takes into account the following elements [TANEGA 1994]:

- Title of the environmental policy
- The need for an environmental policy (see chapter 1.5 on page 9)
- Statement of policy (commitment and environmental issues)
- Procedure and guidelines for implementing the environmental policy
- Responsibility and authority
- Definition of terms

The environmental policy statement should be communicated internally and made available to the public.

After the environmental policy statement is approved by the CEO and publicized, top management should set objectives and targets - at least for the highest priority environmental aspects - which include a time frame within which they must be achieved. To set targets, management must put the environmental priorities in concrete terms. For more information on this step, see chapter 3.3.4 on page 35.

PUROLATOR PRODUCTS	SECTION: 0 General	Pages: 1
MANAGEMENT SYSTEM MANUAL	0.2 Environmental, Health, and Safety Policy (Fayetteville Only)	Status: Issued

0.2 Environmental, Health, and Safety Policy

Purolator, Fayetteville Plant, is committed to develop and operate an Environmental, Health, and Safety (EHS) System to provide:

* **Compliance with relevant environmental, safety and health legislation and regulations**
* **Compliance with Purolator's safety and health program and other requirements**
* **Continual improvement through the achievements of targets and objectives**
* **Prevention of pollution through the reduction of environmental emissions and waste disposal**

The framework for establishing, implementing, and maintaining our Environmental, Health, and Safety System provides the following activities:

* **Communication of this policy to all employees**
* **Making this policy available to the public**
* **Setting and reviewing EH&S objectives and targets**

Linked procedures apply to all Plants unless specifically noted.

Revision:	Effective Date:
5	10/29/98
Last Rev. Date:	Author:
07/14/99	Wes Thomas

SIA is committed to protect the environment by reducing the present and and future environmental risks of its business operations.
Our Environmental Policy is:

Minimize Environmental Risks

of our business operations. This means that SIA is committed to: complying with all applicable environmental laws and regulations, investigating and controlling the impact of hazardous releases to the environment, continually improving operations which could have a significant impact on the environment, educating associates to be responsible environmental stewards through recycling, conserving resources and ultimately eliminating waste and the environmental risks of our business operations.

SIA®

Revision # 0	Effective Date: # 06/98	Document Type: Level 1
Document Title Eastern Region Land and Timber Environmental Policy		
Approved: (Signature – Morris C. Wright)		Page 1 of 1

INTERNATIONAL (logo here) PAPER

CORPORATE POLICY
Environment, Health and Safety

An essential part of our business strategy is to make products in a safe and healthful work place, to manage natural resources wisely, and to continually improve our environmental performance. We are committed to removing the conditions and behaviors that cause personal injury or environmental impact. Therefore, we will:

- Comply with all applicable environmental, health and safety laws and regulations, with the company's own environmental, industrial hygiene and safety policies and commitments and with the Sustainable Forestry Initiative (SFI™) and with the Environmental, Health and Safety principles of the American Forest and Paper Association.

- Undertake with our employees the creation and maintenance of an accident and injury-free workplace.

- Emphasize prevention of pollution, elimination of process excursions and continual improvement through employee diligence as the best practicable means to improve the environmental performance of our operations.

Business site managers have the responsibility to assure that their business site:

- Complies with applicable environmental, health and safety laws, regulations and corporate policy and to certify to this requirement.

- Develops, implements and maintains effective systems, procedures and training to achieve and maintain an accident-free, injury-free and healthful workplace.

- Integrates continual environmental, health and safety improvement, pollution prevention and employees diligence into daily operations.

- Develops site-specific annual objectives for environmental, industrial hygiene, safety and worker's compensation improvements that support these goals, policies and statements.

(Signature)
John T. Dillon
Chairman & Chief Executive Officer

April, 1997
Supporting Documents
International Paper Environment, Health and Safety Principles
International Paper Forest Management Principles

Environmental Policy

Carrier Solutions RTP Area Operations (RAO) commits to demonstrate environmental leadership in the telecommunications industry and to protect and enhance the environment through sound management decisions.

Carrier Solutions RAO commits to:

- Comply with all relevant environmental legislation and other standards to which we subscribe.
- Prevent Pollution by minimizing resource consumption, waste generation and adverse environmental impacts whenever technologically and economically viable.
- Set and review objectives and targets to ensure continual improvement of the EMS and our environmental performance.
- Participate in efforts to share with suppliers, customers, industry and the community, appropriate knowledge and technology that benefit the environment.

(from Nortel Networks, RTP, NC Carrier Solutions Operations, Issue Date: 6/30/1999)

ENVIRONMENTAL POLICY

UNIROYAL CHEMICAL, GASTONIA PLANT WILL:

1. PRODUCE, STORE, TRANSPORT, USE, AND DISPOSE OF CHEMICALS IN A MANNER THAT PROTECTS THE ENVIRONMENT AS WELL AS THE HEALTH AND SAFETY OF THE WORK FORCE AND THE PUBLIC.

2. COMPLY WITH ALL THE LAWS, REGULATIONS, AND STANDARDS APPLICABLE TO OUR PRODUCTS, PROCESSES AND WASTES.

3. ACTIVELY PURSUE REDUCTIONS OF THE GENERATION OF WASTE AND THE DISCHARGE OF CONTAMINANTS INTO THE ENVIRONMENT.

4. COMMIT TO CONTINUAL IMPROVEMENT BY SETTING AND REVIEWING OBJECTIVES AND TARGETS.

5. UNDERTAKE SCHEDULED ENVIRONMENTAL ASSESSMENTS OF THE GASTONIA PLANT.

6. ENTRUST EACH MANAGER/SUPERVISOR WITH THE RESPONSIBILITY FOR THE ENVIRONMENTAL PERFORMANCE OF HIS/HER AREA.

7. CONTINUE TRAINING OF PLANT PERSONNEL ON THE ASPECTS OF ENVIRONMENTAL RESPONSIBILITY.

8. COMMUNICATE THIS POLICY TO ALL EMPLOYEES AND TO THE PUBLIC.

R.I. MARIONNEAUX

FACTORY MANAGER

BRIDGESTONE/FIRESTONE WILSON PLANT
HEALTH, SAFETY, QUALITY & ENVIRONMENTAL POLICY

HEALTH AND SAFETY POLICY

Bridgestone/Firestone Wilson Plant management is committed to providing a safe, healthy workplace for our associates. To meet this commitment, our health, safety, and loss control programs must be: CONTINUING, AGGRESSIVE, & EFFECTIVE.

The purpose of these programs will be to:

- Protect employees from occupational illness or injury
- Protect BFS equipment and property from loss or damage

These programs will be actively conducted within all departments and will support the guidelines of the BFS Wilson Health and Safety Program.

QUALITY POLICY

We will maintain our quality systems, processes and standards to meet the changing needs of our customers and to assure the quality of our products.

We will strive for continuous improvement through teamwork and the education of our people.

ENVIRONMENTAL POLICY

We will produce competitive products to meet customer requirements while operating in an environmentally responsible manner. The Plant Manager and his management team are committed to implementing an effective environmental management system designed to accomplish our strategic business objectives and fulfill our responsibility as a good industrial employer and neighbor in the Wilson community. We shall:

- Conduct business so that environmental challenges are managed as an integral part of current and changing business strategies.
- Communicate about environmental issues.
- Comply with applicable federal, state, and local environment laws, and meet other environmental commitments we make.
- Promote pollution prevention.
- Continually improve the environmental management system.

John McQuade
5/3/99

Controlled Document

WASTEWATER DIVISION

Environmental Policy

The Wastewater Division is committed to continual improvement of its environmental performance, and to provide sound stewardship of the environment consistent with the Division's mission.

To achieve the policy goal, the Wastewater Division will:

- Identify and pursue opportunities to protect or improve the environment
- Provide leadership in environmental protection and restoration
- Comply with the letter and spirit of applicable environmental laws and regulations
- Provide environmental training to all employees
- Communicate and reinforce this policy throughout the Division
- Prevent, minimize, or mitigate adverse environmental impacts of the Division's activities
- Consider environmental consequences and sustainability concepts when making planning, purchasing, contracting, and operating decisions, including the impacts of producing, using, and disposing of materials
- Strive to prevent pollution by reducing, reusing, recycling, and properly disposing of waste generated throughout the Division's facilities and activities.
- Optimize the efficient use of energy and water resources throughout all activities
- Work continuously to improve and monitor the effectiveness of environmental management programs
- Seek support of governing bodies and ratepayers to implement and sustain a comprehensive environmental management system

Approved by Management Team 11/29/99
Revised by Management Team 2/7/00
Revised by Metropolitan Wastewater Management Commission 4/20/00
Approved by Public Works Director 5/1/00

Eugene OR

City of Seattle
Environmental Management Program

Home	EMP Policy Fact Sheets	EMP Manual	EMP Committees & Oversight
Air Quality/Smog Watch	Green Purchasing	Pesticide Use Reduction Strategy	Trees
Office of Sustainability & Environment	Links	Downloadable Documents	What's New

Environmental Program Manual

5 ENVIRONMENTAL POLICY, OBJECTIVES, AND MONITORING

5.1 Environmental Policy and Objectives

It is the policy of the City of Seattle to conduct its operations in an environmentally responsible and sustainable manner; to comply with environmental laws and regulations; to reduce its use of resources and generation of waste; and to lead by example. (Section 2.1)

The following principles elaborate on this policy and describe how the City will conduct its business in seeking to achieve its environmental objectives:

- Work proactively to comply with all applicable environmental laws and regulations;
- Identify environmental targets that represent performance beyond regulatory compliance, and strive to meet or exceed them;
- Review our environmental performance against targets and objectives annually and identify opportunities for continued improvement;
- Manage our operations to avoid or minimize impacts to the ecosystems we depend upon;
- Factor in the economic and environmental costs, risks, benefits, and impacts, from a life cycle perspective, when making planning, contracting, purchasing, and operating decisions;
- Reduce the quantity and toxicity of materials used and waste generated from our facilities and operations through source reduction, reuse, and recycling;

- Design, construct, and operate City facilities to minimize environmental impacts by incorporating energy efficiency, water conservation, waste minimization, pollution prevention, and resource-efficient materials through all phases of a facility's life.
- Seek the commitment of all employees to environmental stewardship through communication, training, and support for employee leadership;
- Involve our citizens in improving our environmental performance;
- Develop and maintain cooperative relationships with regulatory agencies and tribal governments;
- Collaborate with other organizations to achieve shared environmental goals.

The planning process (described in Section 2) included establishing the City's environmental policy, reviewing the general environmental aspects of operations, and identifying the associated legal requirements. Based on the results of that process and consistent with the policy statement and associated principles, the following objectives were established. The objectives provide direction for developing specific policies and procedures and form the basis for monitoring our progress.

The City's environmental objectives are to:

- Comply with regulations;
- Reduce pollution at the source;
- Reduce consumption of resources; and
- Continually improve environmental performance.

The specific environmental policies and procedures found in Section 6 address the City's activities, products, and services that have potentially significant environmental impacts. These policies and procedures provide policy direction for departmental operations and clarify roles and responsibilities. Implementation of the procedures is intended to move the City toward achieving its environmental objectives.

5.2 Environmental Indicators and Targets

This section of the Environmental Management Program (EMP) Manual describes how the City will "keep score" of its environmental performance. Environmental indicators serve as part of an organization's feedback loop, indicating the effectiveness of actions and programs in achieving its objectives. Environmental indicators also serve as a way to communicate clear information to the stakeholders about the City's progress.

ISO 14031 (now a draft international standard) is the member of the ISO 14000 series of standards that addresses environmental performance. The draft ISO 14031 guidance classifies environmental indicators into two categories:

Mayville
METAL PRODUCTS
A DIVISION OF CONNELL LIMITED PARTNERSHIP

Environmental Policy

- Mayville Metal Products, a division of Connell Limited Partnership, is committed to conducting it's operations in such a manner as to comply with all applicable federal, state, and local environmental protection laws and regulations, including the laws and regulations covering the generation, discharge, and disposal of hazardous or toxic materials. Commitment includes all other requirements to which we subscribe.
- We are committed to sound environmental management practices allowing for continual improvements within the environmental management system.
- We are committed to prevention of pollution and the manufacture of products in a manner that reduces releases to the environment.
- We are committed to being an environmentally responsible neighbor to the community.
- We are committed to recycle and reduce materials to reduce waste generation. Remaining waste will be disposed in compliance with all applicable federal,

- We are committed to reduce the quantity of hazardous waste by recovery or by process changes and take preventive measures to avoid the risk of soil contamination or leakage or discharges into surface or underground waters.
- New processes may be required in some instances to properly implement this policy. Our President and General Managers shall ensure that development work is undertaken, in each appropriate case, to determine the economic feasibility of process changes to eliminate or reduce waste, recovery or reduction to acceptable levels.
- We are committed to knowing our significant environmental aspects and impacts.
- We are committed to setting, and meeting or exceeding our objectives and targets for continuous improvement of our significant environmental impacts.
- Our General Managers are responsible for regularly reporting to the President the status of our environmental objectives and targets.

NOTE: Mayville Metal Products must also conform to Connell Limited Partnership's "Environmental Compliance Policy" Policy # 4.0

Signature  Date: October 1, 1999

President, Mayville Metal Products
A Division of Connell Limited Partnership

SECTION 4.2 - ENVIRONMENTAL POLICY

The EMS Management Team will review the policy annually. If revisions are necessary, the revised policy will be adopted by the City Council in **November**.

The policy will be made available to the public through the City of Gastonia's web-site. The policy will be communicated to all WWTD employees through training events.

CITY OF GASTONIA
WASTEWATER TREATMENT DIVISION

ENVIRONMENTAL POLICY

The City of Gastonia Wastewater Treatment Division is committed to the implementation of a management system which will minimize negative and advance positive impacts on the environment and which will control the wastewater treatment costs to be borne by the consumer. Believing these goals to be fully achievable, the Wastewater Treatment Division is firmly committed to and will:

- Establish procedures to promote continuing improvement of compliance with all applicable environmental laws and regulations.
- Establish procedures to continue efforts to strengthen and improve knowledge of environmental issues within the Division.
- Seek optimal operation of the Wastewater Treatment Facilities to minimize environmental impacts where technically and economically feasible, even if not required by law or regulation.
- Promote cooperation and understanding with the public, customers, and governmental agencies in developing economically feasible and environmentally sound wastewater treatment objectives.
- Continue to promptly report all noncompliance issues in accordance with applicable governmental reporting requirements, evaluate causes of noncompliance, and implement corrective actions.
- Establish procedures for periodic review of environmental compliance with all laws and regulations, as well as with the ISO 14001 Environmental Management System.
- Establish procedures to ensure all that employees are knowledgeable of, and understand and comply with, all applicable environmental laws and regulations.
- Promptly correct any practice or condition not in compliance with this policy.

All employees are expected to comply with the spirit as well as the letter of this policy.

Andy Duncan/MtHolly/Primary
 # 1 Title: EMS Management Representative

Alcoa - Mt. Holly Environmental Policy

ENVIRONMENTAL POLICY

Mt. Holly is committed to the protection of the environment by maintaining high environmental quality standards which meet or exceed those required by regulation.

The best available pollution control equipment for the aluminum industry is installed and the resources provided in terms of properly trained personnel and operating budget to responsibly maintain these standards.

Management is dedicated to establishing and maintaining an environmental management system that ensures optimum pollution prevention and regulatory compliance through the development, monitoring, and measurement of objectives and targets.

This system shall define operating and compliance standards and will cultivate continuous improvement of environmental awareness and performance.

SECTION: 4.2	ENVIRONMENTAL POLICY	PAGE: 1 of 1
WRITTEN BY: C. Kirkland	REVISED BY: A. Duncan	REVIEWED BY: C. Kirkland
DATE WRITTEN: 06/10/96	DATE REVISED: 8-19-96	DATE REVIEWED 8/20/96
REV. NO.: 1	APPROVED BY: Paul Campbell	DATE APPROVED: 9/10/96

Top management at Alumax of South Carolina shall define the environmental policy for the Mt. Holly facility. The policy shall comply with the requirements stated in the ISO 14001 Standard and the corporate policy established by Alumax Inc. The Mt. Holly policy will complement the corporate policy but will be specific to Alumax of South Carolina. Both policies shall be included in this section to formally document the policies and to provide for communication of the policies.

ALUMAX OF SC ENVIRONMENTAL POLICY

Alumax of South Carolina is committed to the protection of the environment by maintaining high environmental quality standards which meet or exceed those required by regulation.

The best available pollution control equipment for the aluminum industry is installed and the resources provided in terms of properly trained personnel and operating budget to responsibly maintain these standards.

Management is dedicated to establishing and maintaining an environmental management system that ensures optimum pollution prevention and regulatory compliance through the development, monitoring, and measurement of objectives and targets.

This system shall define operating and compliance standards and will cultivate continuous improvement of environmental awareness and performance.

ALUMAX, INC ENVIRONMENTAL POLICY

Alumax management believes that profitable industrial enterprise and environmental protection are mutually achievable objectives. Our goal is to attain both.

Accordingly, all Alumax businesses shall:

- Establish and maintain programs to ensure all employees know, understand and comply with all applicable environmental laws and regulations.
- Adopt scientifically and environmentally sound standards and practices to guard against environmental degradation, even if such measures are not required by law.
- Promote public understanding of its operations and work with government agencies and others to develop laws and regulations which encourage environmentally sound growth.
- Establish an appropriate audit or review program and procedures to periodically evaluate environmental compliance at reasonable intervals.
- Promptly report all areas of non-compliance in accordance with applicable governmental reporting requirements.
- Correct promptly any practice or conditions not in compliance with this policy.

All employees are expected to adhere to the spirit as well as the letter of this policy.

Allen Born
Chairman and Chief Executive Officer (Reissued May, 1994)

Environmental Policy Example #1

Tufts University's policy is succinct and far-reaching and identifies the both operational efficiency and awareness through education as keys to achieving its stated goal.

Tufts University

Tufts University Environmental Policy

We, the Tufts University community, affirm our belief that university faculty, staff and students have a responsibility to take a leadership role in conducting activities as responsible stewards of the physical environment and using educational activities to promote environmental awareness, local action and global thinking.

In our University function, Tufts University will strive to:

- conserve natural resources and support their sustainable use;
- conduct affairs in a manner that safeguards the environmental health and safety of students, faculty, staff and communities;
- reduce the use of toxic substances and the generation of wastes and promote strategies to reuse and recycle those wastes that cannot be avoided; and purchase renewable, reusable, recyclable and recycled materials.

In our education and research missions, Tufts University will strive to:

- foster an understanding of and a responsibility for the physical environment;
- ensure that individuals are knowledgeable about the environmental and health issues that affect their discipline;
- encourage environmental research;
- conduct research and teaching in an environmentally responsible way; and
- provide a forum for the open flow of information among government, international organizations, industry and academia to discuss and study environmental issues and their relationships to other social issues.

Environmental Policy Example #2

Brevard Community College's policy is a simple statement recognizing the potential for improvement and lists specific objectives supporting that initiative.

Brevard Community College

Policy Regarding Protection of the Environment

The Board of Trustees recognizes that the educational and responsible use of natural resources and protection of the environment is consistent with the standards of Brevard Community College and all its students and work family, and the Board recognizes a tremendous potential exists for improvement which is more in harmony with the ideas of the College. Therefore, Brevard Community College reaffirms these principles by adopting this policy related to sound environmental management and encourages all staff and students to be aware that:

- All buildings will be constructed with the utmost concern for their environmental impact
- The College will pursue a sound program for energy efficiency and conservation
- The college will ensure that proper handling and disposal be conducted for all hazardous waste materials
- The college will seek alternatives to products which are environmentally detrimental
- All faculty and staff are encouraged to implement and update periodically an awareness program of education in the conservation of energy, the recycling of materials and the handling of hazardous waste

Environmental Policy Example #3

University of Massachusetts Lowell's policy includes the three ISO 14000/1 precepts of continual improvement, pollution prevention, and compliance as well as a mnemonic for their top five priority within their environmental policy.

University of Massachusetts Lowell

Environmental Policy

January 2001

As a public institution of higher education, University of Massachusetts Lowell is committed to being a model of environmental health and safety in our teaching, in our research, in our partnerships with the community, and in the management of our own organization. The University challenges and empowers each employee and student to promote environmental leadership through our environmental principle, ***"Ride the CREST":***

- **C:** Continuous Improvement
- **R:** Reduce, Reuse, Recycle
- **E:** Environmental Compliance
- **S:** Stewardship
- **T:** Training and Education

Continuous Improvement
...To enhance the environmental management system through checking, corrective action and annual top management review to achieve improvements in overall environmental performance.

Reduce, Reuse, Recycle
...To use processes, practices, materials or products that avoid or reduce pollution, which may include process changes, efficient use of resources, material substitution and recycling.

Environmental Compliance
...To meet and where practical exceed all relevant current environmental laws and regulations.

Stewardship
...To empower employees and students to identify significant environmental aspects of our activities, products, and services, and to implement programs with targets and objectives that protect the health and safety of people and the ecosystem.

Training and Education
...To provide appropriate training to all employees and students to ensure competence and awareness of our environmental policies and procedures, the significant environmental impacts of their work or activities, their roles and responsibilities in support of our environmental management system, and the potential consequences of departure from specified procedures.

4.2 ENVIRONMENTAL POLICY

The University of Missouri-Rolla (UMR) has a major responsibility to educate tomorrow's leaders in engineering and science. UMR believes that proactive environmental management is a fundamental component in educating our future leaders. UMR is committed to the protection of human health and the environment by integrating environmental stewardship into the education, research, administration, and business activities of the university. UMR is dedicated to an environmental management system that is focused on continually improving its impact on the environment, preventing pollution, and ensuring compliance with relevant environmental legislation and regulations, as well as with other requirements to which the university has subscribed.

John T. Cook Chancellor	4/18/2000 Date
Vice-Chancellor of Administrative Services	4-18-2000 Date
Vice-Chancellor of Academic Affairs	18 APR 00 Date
Wendell R. Crowley Vice-Chancellor of Student Affairs	4/18/00 Date
Vice-Chancellor of University Advancement	4/18/00 Date
Russell D. Case Dean of College of Arts and Sciences	4/18/2000 Date
Robert Mitchell Dean of School of Engineering	4/18/00 Date
Lee W. Kapperman Dean of School of Mines and Metallurgy	18 April 2000 Date

Sample policy – Actual policy reproduced with permission. Policy is not in original format.

NEO INDUSTRIES
HEALTH, SAFETY AND ENVIRONMENTAL POLICY

Neo Industries is committed to managing health, safety and environmental (HS&E) matters as an integral part of our business. In particular, it is our policy to assure the HS&E integrity of our processes and facilities at all times and at all places. We will do so by adhering to the following principles:

Compliance

We will comply with all applicable laws and regulations and will implement programs and procedures to assure compliance. Strict compliance with HS&E standards will be a key ingredient in the training, performance reviews and incentives of all employees.

Where existing laws and regulations are not adequate to assure protection of human health, safety and the environment, we will establish and meet our own HS&E quality standards.

Prevention

We will employ management systems and procedures specifically designed to prevent activities and / or conditions that pose a threat to human health, safety or the environment. We will minimize risk and protect our employees and the communities in which we operate by employing safe technologies and operating procedures, as well as being prepared for emergencies.

We will strive to prevent releases to the atmosphere, land or water. We will minimize the amount and toxicity of waste generated and will ensure the safe treatment and disposal of waste.

Communication

We will communicate our commitment to HS&E quality to our employees, vendors and customers. We will solicit their input in meeting our HS&E goals and in turn will offer assistance to meet their goals.

Continuous Improvement

We will continuously seek opportunities to improve our adherence to these principles, and will periodically report progress to our stakeholders.

{Signature}
Neil K. Holt
President

March 1995

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Pacific Gas and Electric Company

Environmental Quality Policy Statement

PG&E is committed to a clean, healthy environment. We will provide our customers with safe, reliable, and responsive utility service in an environmentally sensitive and responsible manner We believe that sound environmental policy contributes to our competitive strength and benefits our customers, shareholders, and employees by contributing to the overall well-being and economic health of the communities we serve.

September 1995

(Actual policy is printed on recycled paper)

We will:

Comply fully with the letter and spirit of environmental laws and regulations, and strive to secure fundamental reforms that will improve their environmental effectiveness and reduce the cost of compliance.

Consider environmental factors and the full acquisition, use, and disposal costs when making planning, purchasing, and operating decisions.

Work continuously to improve the effectiveness of our environmental management.

Provide appropriate environmental training and educate employees to be environmentally responsible on the job and at home.

Monitor our environmental performance regularly through rigorous evaluations.

Seek to prevent pollution before it is produced, reduce the amount of waste at our facilities, and support pollution prevention by our customers and suppliers.

Manage land, water, wildlife, and timber resources in an environmentally sensitive manner.

Use energy efficiently throughout our operations, and support the efficient use of gas and electricity by our customers and suppliers.

Re-use and recycle whenever possible.

Use environmentally preferred materials.

Clean up residual pollution from past operations in a cost-effective manner.

Work cooperatively with others to further common environmental objectives.

Communicate and reinforce this policy throughout the company.

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CAMPBELL & CO. ENVIRONMENTAL POLICY

Campbell & Co's commitment to improve the environment is an expression of our Guiding Principles, and a demonstration of "think globally and act locally" sensibilities.

We strengthen this commitment by employing Quality Operating System methodology as the framework to identify objectives and targets for addressing areas of environmental significance.

Campbell & Co. is improving the condition of our environment by preventing pollution, specifically through the reduction of natural resource usage. We are also helping to preserve the environment by promoting recycling as well as continuing to make responsible environmental choices when purchasing products.

Campbell & Co. will comply with all federal, state and local legislation and regulatory requirements, as well as those requirements adopted through the Michigan Business Pollution Prevention Partnership Policy.

Above all, Campbell & Co. employees will strive to continuously improve our efforts to create a cleaner and safer environment.

_____

David Scheinberg, President & CEO

Created: June 6, 2000
Revised: October 6, 2000

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Village Of Chelsea, Michigan

Statement Of Environmental Policy

The Village of Chelsea is committed to continual improvement of its Environmental Management System and is in compliance with all relevant federal, state, and local environmental legislation and regulations. The Village of Chelsea will meet and strive to exceed all environmental requirements and will seek to prevent pollution before it is produced. To sustain this commitment, the requirements of the Environmental Management System described in this Manual apply to all activities and employees. The Village's Department Superintendents are the Village's Management Representatives who have the responsibility and authority to plan, enforce, and maintain the Village's Environmental Management System. This responsibility also includes stoppage of activities that deviate from the requirements of this Manual. The EMS Management Representative may delegate some of this authority downward through the organization in order to implement the system effectively. We will continuously seek opportunities to improve our adherence to the principles of environmental management.

Policy adopted by Village Council on March 11, 1997.

_____

Village President

_____

Village Clerk

[Signatures included in original policy.]

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Saint Joseph Mercy Hospital (in Michigan) demonstrated that an environmental policy can be written in the form of a procedure. One advantage of this approach is that hospital staff can make a direct connection between the policy and their departmental responsibilities for implementing the policy. The hospital includes its policy in the Administrative Policy Manual because that manual was already well established and widely distributed. Integrating EMS requirements with existing manuals, procedures, training, and responsibilities was a key implementation strategy for the hospital.

Saint Joseph Mercy Hospital

Administrative Policy and Procedure

Subject:	Environmental Compliance Policy
Effective Date:	September 14, 1998
Revised Date:	
Approved By:	President and CEO

POLICY

It is the policy of St. Joseph Mercy Hospital (SJMH), which includes all SJMH owned and operated buildings and services, to conduct all of its operations in an environmentally responsible and sensitive manner. St. Joseph Mercy Hospital will fully comply with both the letter and the spirit of all applicable federal, state and local regulatory requirements governing hazardous materials and wastes, pollution prevention and environmental protection. It is recognized that the health and well being of the environment contributes to the health and well being of the communities and populations we serve. St. Joseph Mercy Hospital will strive to continuously improve its systems and procedures related to environmental protection and pollution prevention activities. St. Joseph Mercy Hospital will manage its facilities and properties in an environmentally responsible manner. St. Joseph Mercy Hospital will participate as appropriate in community, industry, and/or governmental sponsored groups addressing environmental issues affecting the communities we serve.

NARRATIVE

Environmental protection is the responsibility of all SJMH departments and employees. As a health care organization, SJMH must handle and manage a wide variety of potentially hazardous or polluting materials including medical wastes, radioactive materials and hazardous chemicals and wastes. Many of our processes present potential water and air quality issues that demand continuous monitoring and control. Proper and responsible handling of these materials and processes is imperative to prevent pollution, reduce waste and protect our environment. A host of federal, state and local regulatory requirements are in place to guide this organization in achieving environmental compliance.

PROCEDURE

I. Each department will continuously assess its operations to identify potential safety hazards and pollution risks. Each department is responsible for establishing and maintaining department specific policies and procedures designed to reduce or eliminate environmental hazards and minimize any negative environmental impact when applicable.

   A. Potential risks will be minimized to the extent possible by seeking out less environmentally hazardous products, equipment or procedures.

   B. Appropriate engineering controls will be implemented when it is not possible to eliminate an environmentally hazardous material or

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procedure.

C. All departments and employees will strive to reduce all types of wastes through identifying and eliminating wasteful practices and products and participate in organizational recycling and waste reduction programs.

D. Departments will educate and communicate organizational and department specific environmental policies, goals and objectives to employees as required.

E. Departments will consider using products that have recycled content taking economic and quality factors into account.

II. The Safety Steering Committee is responsible for monitoring environmental compliance issues recommending and assuring that corrective action is implemented as warranted to correct deficiencies.

A. Objectives and targets will be established to assure continuous improvement in organizational environmental performance. Safety Committee structure is responsible for establishing goals and implementing programs to meet targets. The Safety Steering Committee is responsible for monitoring progress and reporting activities to Executive Management.

REFERENCES

- Safety Steering Committee
- Hazardous Material and Waste Committee
- Product Value Analysis Committee
- Safety Policy Manual Section III_300 – "Hazardous Materials and Waste"
- Departmental Specific Hazardous Material/Pollution Prevention Policies and Procedures

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NAVAL AVIATION DEPOT
NORTH ISLAND
SAN DIEGO, CALIFORNIA

Statement of Environmental Policy

The Naval Aviation Depot (NADEP), as a provider of engineering, logistics, calibration, manufacturing, overhaul and repair services for U.S. Navy aircraft, ship systems, and other general military aircraft and ships, recognizes its responsibility as a steward of the environment. Throughout the span of our activities, NADEP considers environmental stewardship of equal importance to productivity and product quality.

In recognition of this responsibility to our stakeholders, customers, neighbors and others, NADEP commits to:

- Improvement of environmental performance on a continual basis;
- Adherence to all relevant environmental legislative, regulatory, permit, and other requirements;
- Prevention of pollution; and
- Utilization, development and production of products that minimize environmental impacts to the extent economically and technologically feasible.

It is the responsibility of all NADEP personnel to ensure the protection of the environment, and implement this policy within the span and control of their individual business activities. In order to accomplish this, NADEP will communicate this policy to our employees, stakeholders, and interested public.

E. L. CHENOWETH
Captain, U.S. Navy
Commanding Officer, Naval Aviation Depot
June 12, 2000

The United States Postal Service has established the following framework for planning activities associated with environmental activities:

- An environmental policy
- Guiding principles
- Strategic objectives and targets

Federal and state laws and regulations provide additional structure for determining how the Postal Service will manage its environmental issues.

These structural mechanisms are described below.

Policy

The foundation of the Capital Metro Operations Strategic Environmental Management Plan is the United States Postal Service Environmental Policy, which states the intent of the Postal Service in regard to its overall environmental performance and provides a framework for action:

> *The United States Postal Service is committed to provide employees and customers with a safe and healthy environment. Environmental protection is the responsible thing to do and makes for sound business practices.*

Guiding Principles

The United States Postal Service has guiding principles that are the hallmark for environmental protection for the organization. These principles act as a compass for decision making in translating the policy into action at all levels within the Postal Service.

1. Environmental Policy

DEQ's Mission Statement and Environmental Policy:

Mission Statement

The DEQ is dedicated to protecting Virginia's environment and promoting the health and wellbeing of the citizens of the Commonwealth. We accomplish this by planning and implementing environmental programs, and by resolving issues efficiently, openly, fairly, and consistently.

Environmental Policy

Commitments: *The DEQ, in its operations and activities, will demonstrate leadership* and environmental stewardship *through an EMS that:*

- *Ensures DEQ's compliance with all applicable environmental laws and regulations;*
- *Identifies and implements techniques and environmentally sound practices that emphasize the environmental management hierarchy of pollution prevention (source reduction), reuse, recycling, treatment, and environmentally safe disposal;*
- *Promotes continual improvement in the DEQ's EMS practices and leading to improved environmental performance;*
- *Openly communicates to all employees and the public, the DEQ's EMS policy, our identified environmental aspects, objectives and targets and programs to achieve them, and the results of these efforts;*
- *Provides human, financial and technical resources appropriate to the active management and maintenance of the EMS; and*
- *Encourages all employees, to the best of their abilities, to be accountable for implementing, maintaining, and upholding this policy.*

Partnership: *The DEQ will encourage environmental stewardship and foster improved environmental collaboration with stakeholders by:*

- *Exchanging mutually beneficial knowledge with, and encouraging open communication among, all partners including the regulated and non-regulated communities, the general public, DEQ employees, and other State agencies; and*
- *Encouraging and recognizing innovative ideas and solutions.*

Performance: *To achieve the goals and objectives of the EMS, and to promote continual improvement, the DEQ will develop and implement an environmental management system that includes:*

- *A direct link to DEQ's strategic planning and budgeting process;*
- *Appropriate procedures and training; and*
- *Performance measures, self-assessment, and independent assurance reviews.*

Dennis H. Treacy, Director
Virginia Department of Environmental Quality

This Environmental Policy shall be communicated to all employees by the EMS Manager and maintained on DEQ's website by the Public Affairs Manager.

2. Environmental Aspects, Objectives and Targets, and Environmental Management Programs

2.1. Environmental Aspects

Each year, in the month of February, the EMS Program Team (see Structure and Responsibility, §4) shall 1) develop an inventory of DEQ's environmental aspects and impacts, 2) determine which aspects are potentially significant impacts and 3) use this information in establishing environmental objectives and targets for the upcoming fiscal year.

The results of exercising this procedure shall be maintained by the EMS Manager in a document that records the findings of the EMS Program Team, the environmental objectives and targets, the management programs and plans for achieving them, and progress toward achieving environmental objectives and targets.

2.2. Objectives and Targets

Concurrent with its determination in February of each year as to which of DEQ's environmental aspects are potentially significant environmental impacts, the EMS Program Team shall establish environmental objectives and targets for the upcoming fiscal year. These Environmental Objectives and Targets shall be documented and maintained by the EMS Manager.

2.3. Environmental Management Programs

Concurrent with its determination in February of each year as to which of DEQ's environmental aspects are potentially significant environmental impacts and its establishment of Environmental Objectives and Targets, the EMS Program Team shall establish management plans and programs to achieve the environmental objectives and targets for the upcoming fiscal year. These management plans and programs shall include designation of person(s) responsible for their achievement, means and methods of achievement, and timeframes for achievement. These Management Plans and Programs shall be documented and maintained by the EMS Manager.

3. Legal and Other Requirements

In line with DEQ's Environmental Policy commitment to complying *"with all applicable environmental laws and regulations,"* the Director shall require the Director of Administration and each of the Regional Directors to compile archives of relevant environmental laws,

Epson Portland Inc.

Environmental Policy

Environmental Philosophy

As a member of the Seiko Epson Group, Epson Portland Inc. shall fulfill its social obligation as a good corporate citizen, striving to achieve a harmonious balance between its business activities and the global environment and by taking active steps to use resources efficiently and prevent pollution.

Environmental Policy

Epson Portland has established policies based on the Environmental Philosophy and pledges to carry them out with full participation. EPI will use these policy statements as a benchmark to gage current and future activities and to determine corporate environmental objectives and targets, including identifying significant aspects when appropriate. These will be reviewed by EPI senior management annually.

Epson Portland will:

- **Environmentally Sound Processes.**
  Use environmentally sound manufacturing processes to create and offer environmentally sound products.

- **Prevent Pollution.**
  Prevent pollution by defining, monitoring and raising the environmental control level through continuous improvement of our manufacturing processes.

- **Contribute to the Environment.**
  Contribute to the environmental efforts of both the local and international community.

- **Employee Volunteer Programs.**
  Support various employee volunteer programs, such as:
  Road Warriors Highway Clean - up, and Earth Day Activities.

- **Comply with Regulatory Requirements.**
  At a minimum, comply with applicable legislative and regulatory requirements with the goal of minimizing the impact on the surrounding environment.

- **Conform to ISO 14001 Requirements.**
  Establish and maintain an Environmental Management System that conforms to the requirements of ISO 14001.

4/1/98
Akio Mitsuishi, EPI President

4/1/98
Steve Klein, EPI Exec. Vice President

Rejuvenation Inc.

Environmental Management System Manual

EP-00020

ENVIRONMENTAL POLICY **ISO 14001 §4.2**

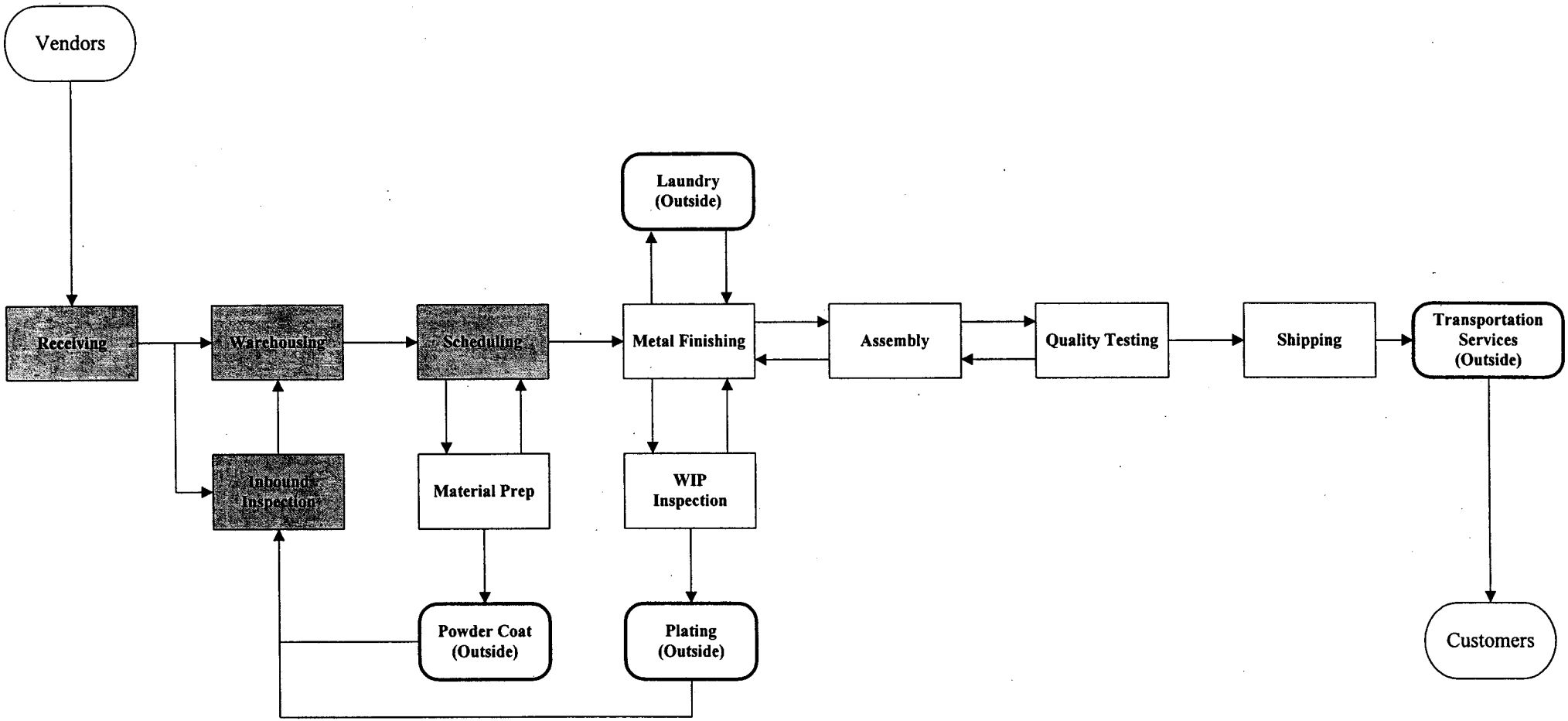
Rejuvenation is commited to excellent environmental performance, continually improving toward environmental sustainability. We believe that preservation of natural capital is essential to human progress world-wide.

Rejuvenation assures conformance with this policy through the use of its Environmental Management System (EMS), which is informed by International Standard ISO 14001.

Our Environmental Management System (EMS) is fundamentally based on The Natural Step's first-order scientific principles of sustainability, and is further guided by pollution prevention, fairness and efficiency of resource use, waste reduction, legal compliance, and the application of emerging technologies. Rejuvenation adopts the following definition of sustainability, as established by The Natural Step:

> In order for a society to be sustainable, nature's functions and diversity must not be systematically:
>
> > Subject to increasing concentration of substances extracted from the earth's crust;
> >
> > Subject to increasing concentrations of substances produced by society;
> >
> > Impoverished by over harvesting or other forms of ecosystem manipulation.
> >
> > In addition, natural resources must be used fairly and efficiently in order to meet basic human needs worldwide.

Rejuvenation Manufacturing
Major Process Flow Diagram



Major Process Flow Diagram.vsd

Environmental Policy

Wacker Siltronic Corporation

Purpose

We are committed to *Environmental Management Systems* for environmental protection as a practical tool for reducing our impact on the environment and making continuous improvements to our operations and performance. We are fully committed to sustainable development, a principle that is a integral part of our business thinking and practices.

Policy

Wacker's commitment to environmental protection is demonstrated by our actions

- *We are committed to the safe handling of materials in our manufacturing processes.*
- *We minimize resource use, energy consumption, emissions and waste*
- *We build programs to reduce our impact on the environment.*
- *We observe legal regulations and self imposed additional standards.*

We regularly review the effectiveness of environmental programs, set targets and assure they are met. We improve understanding and awareness of environmental principles and obligations by regularly training

All employees share the responsibility for environmental protection as well as for ongoing improvements in this area.

James R. Ellis, President and CEO

Ulrich F. Pilz, Chief Financial Officer

Andy P. Pihl, AW Fab Manager

Terry J. Dalrymple, SW Fab Manager

WACKER

Aspects are placed in the following categories:

- Use of natural resources
- Use of raw materials
- Use of chemicals and gases

Inputs

- Product

- Emissions to air
- Generation of solid wastes
- Generation of liquid wastes
- Generation of hazardous wastes
- Releases to water
- Releases to water – River
- Releases to water – POTW
- Releases to water – Stormwater

Outputs

- Use of Land
- Material Handling
- Treated Drain Systems
- Generation of odors
- Generation of noise
- Other

Activities

32048c PDF

Environmental Aspects
4.3.1

Section I

"Identifying Environmental Aspects" from NSF Guide

"Determining Significant Environmental Aspects and Setting Objectives" from EPA IEMS Guide

"Identifying Significant Environmental Aspects and Impacts" from NSF Metal Finishers Guide

"Environmental Aspects and Impacts" from Colleges & Universities EMS Guide

Section II

Aspect & Impact Rating Worksheet

Environmental Aspect Scoring Guide

City of Gastonia EMS Aspects/Impacts Analysis Procedure

Charleston Public Works Aspect/Impact Procedure

Alumax Planning Procedure

NNBNA Environmental Aspects SOP

Naval Aviation Depot North Island Environmental Aspects Procedure

Virginia Department of Environmental Quality Environmental Aspects Statement

Johnson Controls, Inc Instructions for Environmental Aspect Identification Form

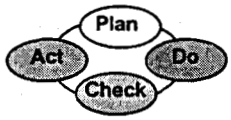
Epson Portland Inc, E A/I worksheets

Rejuvenation Inc E. A/I forms

Wacker Siltronic Corporation E A/I

Sample A/I Form

Comments:



Identifying Environmental Aspects

How an organization interfaces with the environment

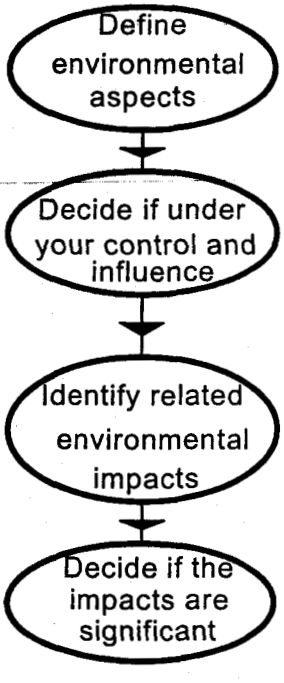
Environmental Aspect:

"Element of an organization's activities, products, or services that can interact with the environment."

ISO 14001

Environmental Impact:

"Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products, or services."



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.** Stated another way, *how does your organization (i.e., your products, services and activities) interact with the environment?*

If your organization has undertaken pollution prevention projects, you are probably familiar with this concept — that is, you must know **how and where** a waste is generated in order to minimize or eliminate it. And like pollution prevention, the identification and management of environmental aspects can (1) have positive impacts on the bottom line and (2) provide significant environmental improvements.

So, an EMS should include a procedure to identify and assess environmental **aspects** that the organization:

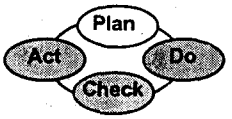
- can **control,** and
- over which it can **have an influence**.

Your organization **is not expected** to manage issues outside its sphere of influence or control. For example, while your organization probably has control over how much electricity it buys from a supplier, it likely does **not** control or influence the way in which that electricity is generated. 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). 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" *(see definition above)* is neutral, so keep in mind that your environmental aspects can be either **positive** (such as making a product out of recycled materials) or **negative** (such as discharging toxic materials to a stream). Aspects may result from **past activities**, such as spills.

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. Aspects that have one or more significant impact should be considered **significant environmental aspects.** These significant aspects should be considered when you establish environmental **objectives**, define **operational controls** and consider other actions, as discussed later.

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A multi-step process can be used to make this evaluation. Keep the resulting information **up-to-date**, so that potential aspects of new products, services, and activities are factored into your objectives and controls.

US Postal Service Assesses Its Environmental Aspects

The **US Postal Service** examined environmental aspects related to the vehicles it operates, the chemicals it uses to maintain equipment, the solid wastes it generates, and the products (stamps) that it sells.

"Products" are tangible results of a process that transforms inputs into outputs (for example, cars or computers). "Services" also result from processes, but are intangible in that you cannot "hold" them (such as dry cleaning or equipment maintenance at a customer site). "Activities" may relate directly or indirectly to the provision of products or services to customers (such as purchasing or product design).



Milan Screw Products set up an internal task group to identify environmental aspects. As part of this process, external stakeholders were identified and interviewed to understand their environmental concerns. These stakeholder concerns were added to the list of environmental aspects.

Hints:

- In identifying aspects and impacts, look **beyond activities covered by laws and regulations.** But because many of your aspects/impacts may be addressed by legal requirements, your compliance program might yield some valuable information. Permits, audit reports, and monitoring records can be useful inputs. Beyond regulated aspects, consider land, energy, and natural resource use, for example.

- Once you have identified environmental aspects and related significant impacts, use this information in setting your objectives and targets. **This does not mean that you need to address all of your impacts at once.** There may be good reasons (such as cost, availability of technology or scientific uncertainty) for addressing some impacts now while deferring action on others. Keep in mind that managing environmental aspects can have **positive impacts** on the organization.

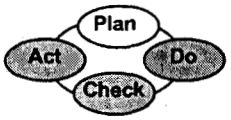
- Remember to look at **services** as well as products. While the need to examine on-site operations might be obvious, you also should consider the potential impacts of what you might do **"off-site"** (such as servicing equipment at customer sites). Similarly, the environmental aspects of the products, vendors, and contractors **you use** may be less obvious, but should still be considered.

- Identifying significant environmental aspects is one of the most critical steps in EMS implementation. It can be one of the most **challenging** – as well as one of the most **rewarding**. Decisions you make in this step can affect many other system elements (such as, setting objectives and targets, establishing operational controls and defining monitoring needs). Careful planning of this activity will pay dividends in later steps.

Getting Started

- To understand your environmental aspects, it helps to understand the processes by which you generate products and services. **Flow charting** your major processes can help you understand the process inputs and outputs as well as how materials are used. A sample flow chart is provided in the **Tool Kit** (see Appendix C). You might also want to consider the **views of interested parties** (e.g., neighbors, civic groups, regulators, etc.) in this process. Some organizations have found external parties to be a good resource in identifying environmental aspects.

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In evaluating your environmental aspects and impacts, consider both normal and abnormal (such as start-up and shutdown) operating conditions.

- You can use many sources of information to help you identify and assess your environmental aspects. For starters, look at your permits, the regulations that apply to your operations, EPCRA reports, Material Safety Data Sheets and monitoring records. Trade associations, regulatory agencies, customers and suppliers also might provide useful information to support the assessment

- Your team should define the **criteria** that will be used to determine significance. Such criteria often include the types of impact; the magnitude, frequency and duration of the impact; regulatory status, and other factors. Consider the **questions on the following page** for identifying and characterizing aspects and impacts.



Use visual tools. As a starting point, some organizations prepare maps of their site and building(s), along with surrounding land uses. The implementation team uses these maps to "audit" the site and identify potential environmental aspects.

- Various approaches exist for evaluating environmental aspects and impacts. Select one that can be readily adapted for your use and that makes sense for your organization. Examples of approaches for evaluating environmental aspects and impacts can be found in the **Tool Kit** (see Appendix A).

- Once you've found a process that works for your organization, describe the process in the form of a written **procedure**. A sample procedure for performing the assessment is provided in the **Tool Kit**.

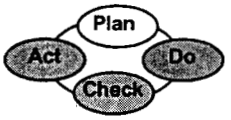
- You can **start out with a simple process** for identifying aspects and impacts, then refine the process in the future as needed. You also can identify and consider more obvious environmental impacts or "low hanging fruit" first, then enhance the assessment process to consider more complex environmental impacts later. As with any element of the EMS, there is virtue in considering how your process for identifying aspects and impacts might be improved over time. Ask yourself: *Is there additional information we should consider in this process? Do we have the right people involved? Are we using the results in a meaningful way?*



- ***Objectives & Targets***
- ***Training & Awareness***
- ***Communications***
- ***Operational Controls***
- ***Monitoring & Measurement***

- Use the **worksheet** at the end of this section to capture some of your ideas. Using this worksheet will give you a "jump start" on implementing this EMS element.

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Identifying Aspects and Impacts: Some Questions to Consider:

Identifying Aspects	Evaluating Impacts
❑ Which operations and activities interface with the environment in a way that could result (or has resulted) in environmental impacts? ❑ What materials, energy sources and other resources do we use in our work? ❑ Do we have emissions to the air, water or land? ❑ Do we generate wastes, scrap or off-spec materials? If so, does the treatment of disposal of these materials have potential environmental impacts? ❑ Which characteristics or attributes of our products or services could result in impact the environment (through their intended use, end-of-life management, etc.)? ❑ Does our land or infrastructure (e.g., buildings) interact with the environment? ❑ Which activities (for example, chemical storage) might lead to accidental releases?	❑ Are the impacts actual or potential? ❑ Are the impacts beneficial or damaging to the environment? ❑ What is the magnitude or degree of these impacts? ❑ What is the frequency or likelihood of these impacts? ❑ What is the duration and geographic area of these impacts? ❑ Which parts of the environment might be affected (e.g., air, water, land, flora, fauna)? ❑ Is the impact regulated in some manner? ❑ Have our interested parties expressed concerns about these impacts?

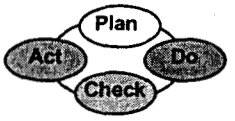
The Link Between Aspects and Impacts (some examples from a real company)

Aspects	Potential Impacts
Emissions of volatile organic compounds	Increase in ground level ozone
Discharges to stream	Degradation of aquatic habitat and drinking water supply
Spills and leaks	Soil and groundwater contamination
Electricity use	Air pollution, global warming
Use of recycled paper	Conservation of natural resources

Some Potential Environmental Aspect Categories:

- Air Emissions
- Solid and Hazardous Wastes
- Contamination of Land
- Local Issues (e.g. noise, odor, dust, traffic, etc.)
- Water Discharges
- Energy Use
- Raw Material and Resource Use (water, energy, etc.)
- Hazardous Material Storage and Handling

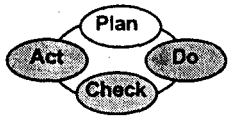
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Capture the Learning: Environmental Aspects Worksheet

Do we have an **existing process** for identifying aspects and/or impacts? If yes, does that process need to be revised? In what way?	
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 an existing organizational process (such as our budget, annual planning or auditing cycles?)	
What are some **obvious environmental aspects** of our: ☛ Operations and activities? ☛ Products? ☛ Services?	
What **sources of information** can we use to identify environmental **aspects**?	
What **sources of information** can be used to determine the environmental **impacts** of these aspects?	
What **significance criteria** might make sense for our organization?	
How will we keep this information **up-to-date**?	
Our next step on environmental aspects is to ...	

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Legal and Other Requirements

Setting the legal framework for your EMS

Legal requirements include:

- Federal requirements
- State and local requirements
- Standards in locations where you sell products/services
- Permit conditions

Other requirements might include (for example):

- *Company-specific codes*
- International Chamber of Commerce (ICC) Charter for Sustainable Development
- *American Chemistry* Council's (ACC) Responsible Care
- American Petroleum Institute's Strategies for Today's Environmental Partnership (API STEP)
- Other industry codes or *programs to which your* organization voluntarily subscribes.

KEY STEPS

- ☑ Identify Requirements
- ☑ Analyze Impacts
- ☑ Communicate
- ☑ Act

In order to comply with laws and regulations that apply to your organization, you must first know **what the rules are** and **how they affect** what you do. As discussed earlier, compliance with legal requirements is one of the "three 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.

Thus, an effective EMS should includes 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.

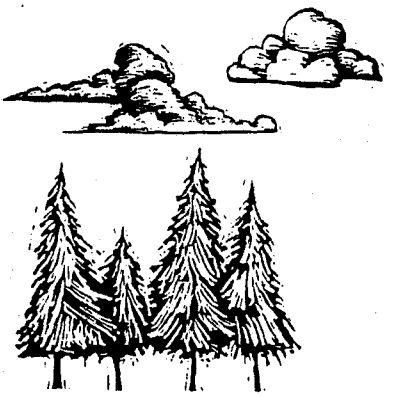
Identifying applicable regulations, interpreting them, and determining their impacts on your operations can be a time-consuming task. Fortunately, there are many methods for obtaining information about applicable laws or regulations. These methods include:

- commercial services (with updates offered on-line, on CD-ROM or in paper form);
- regulatory agencies (federal, state and local);
- trade groups / associations;
- the Internet (see USEPA web site at *www.epa.gov*);
- public libraries;
- seminars and courses;
- newsletters / magazines;
- consultants and attorneys; and
- customers, vendors and other companies.

Small business assistance programs exist in every state. Under the Clean Air Amendments of 1990, each state environmental regulatory agency has established

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MODULE 3: DETERMINING SIGNIFICANT ENVIRONMENTAL ASPECTS AND SETTING OBJECTIVES



From your work in Module 1, you have probably identified a number of "environmental aspects" associated with your company's activities. This module will help you prioritize those aspects. It will also help you determine which one(s) you will want to work on first. Do not expect to work on all the environmental aspects identified. "Continuous improvement" implies that this is an on-going process where you address some concerns now and others in the future.

Your operations may have many environmental aspects, but they may not all be significant. First, by ranking each aspect against a set of environmental criteria (e.g., toxicity, wasted materials), you can determine which are most significant. Next, to select which significant environmental aspects (SEAs) you will work on, rank each aspect against practical criteria (e.g., technical and economic feasibility) and benefits criteria (e.g., improved health). For those aspects you select, you will set objectives in terms of the improvements you hope to make.

Determining which aspects are significant includes making subjective decisions. For this reason, you will improve results by having a team of people who represent different job categories. They can provide a cross-section of operational experience when you work on this module.

Design for the Environment U.S. EPA

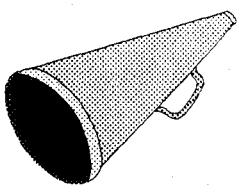
DfE projects emphasize integrating evaluation of both risk and resource conservation into performance and cost evaluations.

Create a Working List of Environmental Aspects

When you developed a list of environmental aspects using the process map of your company's activities, you may have identified a large number of environmental aspects. This is not surprising, since virtually all of your business activities could interact with the environment in some way. In order to identify which environmental aspects are significant, we will review environmental risk information. However, ranking your environmental aspects using environmental risk information can be a labor-intensive process. Therefore, you may want to create a smaller list of environmental aspects to rank using risk information.

First, create a list of selection criteria that suit your company. Below is a list of examples to help you get started:

- Which aspects might affect your company's ability to comply with regulations and other requirements?
- Are there pollution prevention opportunities?
- Are there potential cost savings or business opportunities (e.g., potential customers who require their suppliers to have EMSs)?
- Are there concerns that might be shared by customers or suppliers?
- Is there "low-hanging fruit" that might provide early successes which can serve both to educate employees and to build confidence in the IEMS?
- Are there opportunities to integrate environmental with worker health and safety requirements?
- Are there community concerns regarding your company's activities?



In describing the approach used to identify and prioritize SEAs, one screenprinter stated that his company:

"Brought in a cross-section of staff and conducted facilitated brainstorming. They then captured the information in a matrix to help prioritize aspects."

Another said his company used "common sense." He said,

"A quick walk around any print shop will produce at least enough SEAs to get an IEMS project under way."

- Are there unregulated hazardous chemicals that could be managed better or substituted?
- Are some of your "solutions" to environmental concerns or regulations shifting waste from one media (air, water, land) to another?
- Could resources be used more efficiently, e.g., energy, water, materials?

You may want to use all or some of these, and you may think of others specifically related to your company's circumstances. Create a list of criteria and use that to select a group of environmental aspects to rank.

There are several ways to make this selection. One way is for the IEMS team to review the list of environmental aspects and vote on their top concerns. Set a target number to rank, say ten, and let the top ten environmental aspects be your working list.

When you have a reduced list of environmental aspects (e.g., ten), you are ready to rank them using environmental risk information to determine which are significant environmental aspects.

☞ **Tip**

Remember: "aspect" refers to the potential for environmental impact. A significant aspect would have the potential for large impact, either because impact is likely to occur under current operating conditions, or because there is potential for serious impact. Even aspects that are well-controlled should be considered for their **potential** for impact should controls fail.

Using Environmental Risk Information to Rank Your Environmental Aspects

Although you will not attempt a formal risk assessment for your IEMS, this module will help you apply your working knowledge and judgment about the chemicals and materials your company uses, and the way in which they are used, to select environmental goals to help create healthier working conditions, communities, and environments. This section presents a brief introduction to the concept of risk and to ranking symbols. Then it presents methods to gather chemical and material **effects** information and

rank aspects according to effects; a method for making judgments about **exposure** to chemicals and materials and rank aspects according to exposure; a method for laying out risk as well as other environmental concerns and ranking aspects considering these factors. In addition, methods for ranking environmental aspects as projects in terms of cost and expected improvements are presented as a way to prioritize projects that your company will undertake to get started on your IEMS.

Risk

Risk assessment, in brief, is a process that integrates the work of several sciences to determine the kind and degree of environmental and human health impacts *potentially* produced by *exposure* to a chemical or material.

Risk is composed of two parts: toxicity (hazard or "effects") and exposure. *Toxicity* is the ability to cause harm to the health of humans, wildlife, or vegetation, as well as the type and seriousness of that effect. You will collect the information needed to form a judgment about effects in Worksheet 3-1. You will review the chemical effects information for each aspect and give a rank based on your judgment of the seriousness of the effects of this chemical or substance.

☞ **Tip**

Visit the DfE website for more tools related to risk.

www.epa.gov/dfe

Exposure is the *amount* of material with which workers, the community, or the environment come into *contact*. The amount is determined by both *severity* and *time* of contact. Severity refers to the amount of material that one can come into contact with at any one time. The time of contact depends on the number of times that contact occurs in a given period (the *frequency* of contact) and the *duration* of the contact. You will collect the information needed to form a judgment about exposure in Worksheet 3-2.

materials used in your business operations, you will need to find information on the human health and environmental effects associated with those chemicals. Without this information, you cannot identify the potential impact of each chemical on the environment. Unfortunately, there is no single and comprehensive source of information for most chemicals. Information that will help you understand the effects associated with the chemicals you use may be located in several different sources.

By taking the time and effort to find information about the chemicals you use, you will be able to understand the potential effects of the chemicals on humans and on the environment. You will also know how to use them in a way to minimize or avoid harmful effects. You can decide whether you want to continue using your current chemicals, or find alternatives that would mitigate any potential harmful impact.

Sources of information about chemicals include:

- Manufacturer's Safety Data Sheets (MSDSs). These are supplied by the manufacturer according to OSHA regulation. You should receive a MSDS with any chemicals you purchase. They should be kept in a location that is available for review.
- Your suppliers. Ask them for hazard and exposure information on any products you purchase. Ask them to supply the environmental information that is not on the MSDS.
- Your trade association.
- EPA or state environmental agency.
- Online sources in various websites, e.g. various EPA programs. (EPA's DfE Program website contains a Risk Guide with additional information.)

☞ **Tip**

Remember, any chemical strong enough to take the place of human labor or to make human labor easier is strong enough to have some kind of environmental risk associated with it. The challenge is how to best manage that risk.

Contact with humans and animal or plant life is characterized as occurring along pathways. These pathways describe the routes along which the substance must travel, before it enters an animal or plant, and how the substance is taken up by the living organism. Several pathways for human exposure include:

- breathing the material (inhalation pathway),
- touching the material (skin or dermal pathway), and
- ingesting (eating or drinking) the material (oral pathway).

Using Ranking Symbols

One way to rank environmental aspects is to use symbols representing a range of high (H) to low (L). Whatever ranking you use (Figure 3-a shows an example), phrase the meaning consistently across all ranking categories; this is most straightforward if you think of "high" as meaning a project you would ultimately like to undertake and "low" as one having lesser priority. Thus, when considering environmental effects, a chemical receiving a "low" rank would be one with low impact or good environmental performance.

Figure 3-a: Ranking Symbols

Symbol	Meaning	IEMS Meaning
H	High	Most environmental impact
M-H	Moderately High	More environmental impact
M	Moderate	Medium environmental impact
M-L	Moderately Low	Lower environmental impact
L	Low	Lowest environmental impact

Identify and Rank Potential Human Health and Environmental Effects of Chemicals and Materials

☞ **Tip**

See Appendix B for a list of sample questions to ask your suppliers.

To rank the environmental aspects associated with chemicals and

Organize the information you have into a format that will enable you to make comparisons between aspects. You may find that sometimes there exists very little information for a particular chemical. That discovery in itself is useful. By using this format and showing where information gaps occur, you will know that whatever decision you make now about using a specific chemical may change if information becomes available at a later date. Although you may want to use the chemical now, you may need to make adjustments later when more information becomes available. Worksheet 3-1 will help you organize your information on the chemicals you use in your business activities. The column headings list the categories and specific information needed. The final column asks for your judgment about the ranking of the environmental concerns associated with the chemical or material under consideration.

Figure 3-b lists the kinds of information OSHA requires on an MSDS. Most of the kinds of data listed below can be used to fill in the columns on Worksheet 3-1. Much of the environmental information will have to be found elsewhere.

In addition to carcinogenicity information and qualitative descriptors of health hazards (e.g., sensitizer, causes dizziness, etc.), MSDSs sometimes include *quantitative* toxicity values, which are important for assessing chemicals hazards. These include lethal dose (LD) and lethal concentration (LC) measures, which are typically from laboratory studies done on small mammals such as rats, mice, or rabbits. These measures are used to give guidance as to the dose required to kill a human. This is important information; however, interpreting its meaning is difficult. In general, if you are comparing several chemicals that have LD or LC measures, the lower measure is the most potent

(it means that it takes less to be lethal). Therefore, you would have to be more careful using the chemicals with the lower LD or LC measures, *as compared to* those having higher measures. Be sure to record any quantitative toxicity values found on an MSDS, as well as the more qualitative information.

Figure 3-b: Information on an MSDS

As defined by the Occupational Safety & Health Administration (OSHA) (29 CFR 1910.1200), an MSDS is written or printed material concerning a hazardous material which contains the following:

- The identity of the hazardous material (except as provided for materials that are trade secrets).
- The physical and chemical characteristics of the hazardous chemical (such as vapor pressure, flash point).
- The physical hazards of the hazardous chemical, including the potential for fire, explosion, and reactivity.
- The health hazards of the hazardous chemical, including signs and symptoms of exposure, and any medical conditions which are generally recognized as being aggravated by exposure to the chemical.
- The primary route(s) of entry.
- The OSHA PEL (Permissible Exposure Level), the ACGIH (American Conference of Governmental Industrial Hygienists) Threshold Limit Value, and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the MSDS, where available.
- Whether the hazardous chemical is listed in the National Toxicology Program (NTP) Annual Report on Carcinogens (latest edition) or has been identified as a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest editions) or by OSHA.
- Any generally applicable precautions for safe handling and use which are known to the chemical manufacturer, importer, or employer preparing the MSDS, including appropriate hygienic practices, protective measures during repair and maintenance of contaminated equipment, and procedures for clean-up of spills and leaks.
- Any generally applicable control measures which are known to the chemical manufacturer, importer or employer preparing the MSDS, such as appropriate engineering controls, work practices, or personal protective equipment.
- Emergency and first aid procedures.
- The date of preparation of the MSDS or the last change to it.
- The name, address, and telephone number of the chemical manufacturer, importer, employer or other responsible party preparing or distributing the MSDS, who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.

Worksheet 3-1:[a] Health, Safety and Environmental Potential Effects Information

Operation	Environmental Aspect	Information Sources	Regulatory Data: [b] Carcinogen? OSHA Permissible Exposure Limit (PEL)? Volatile Organic Compound (VOC)? Toxic Release Inventory (TRI)?	Human Health Effects by Pathways Acute and Chronic [c]			Effects on Wildlife and Other Environmental Effects [d]			Worker Safety	Rank	
				Inhalation	Dermal	Oral	Air	Water	Land		Human	Environment
Manufacture Step 1	Chemical 1	MSDS, trade association	yes 10 ppm no no	Chronic: cancer Acute: dizziness	Chronic: sensitizer	acute: LC50 of 100 ppm	ozone depletion	Acute: kills fish	kills worms	flammable		
Contact Person:				Date Completed:								

a Corresponds to Table EA-03 in *Company Manual Template.*

b Most information for this column can be found on the MSDS.

c Partial information for these columns might come from the MSDS, but other resources may be needed. In particular, acute effects are usually reported on MSDS sheets. Chronic effects are sometimes on MSDS sheets, but often will have to be found elsewhere. LC refers to lethal concentration. Inhalation LC50 is the concentration of a chemical in air that causes death in 50 percent of the test organisms at the end of the specified exposure period. LD refers to lethal dose. LD50 is the dose of a chemical taken by mouth, absorbed by the skin, or injected that is estimated to cause death in 50 percent of the test animals. Lethal dose data are expressed in terms of amount of chemical divided by the body weight, e.g., mg/kg.

d MSDSs usually do not include environmental effects.

Note: This worksheet provides an example of the kinds of information found on an MSDS, but it is not a part of the press cleaning example. For more information on risk-related data, including methods for interpreting quantitative toxicity values, refer to the Risk Guide provided on the DfE Program website.

Rank Exposure to Chemicals and Materials

In determining exposure, the amount of material as well as the frequency and duration of contact must be considered. An important element in exposure is contact. If there is no possibility of contact occurring, then there may be no exposure and therefore no risk. In some cases, as when a toxic substance such as lead is embedded in a product such that no contact occurs during use of that product, the toxic substance may still leach out of that product if it is disposed of in a landfill. The possibility of contact throughout the use and disposal of a product should therefore be considered. If, however, a toxic substance is contained such that neither humans nor the environment would come into contact with it, then exposure would be low. In ranking such a chemical use the rank given to the "Workers, " "Community," and "Environment" would be "Low" (L). In ranking exposure, it is, therefore, necessary to consider how contact might occur and whether, in fact, it does.

Severity (Quantity)

Determining the quantity of chemical or material that humans or the environment are exposed to can be difficult, especially if the substance becomes diluted in air as vapor or dust or in water. Potential exposure is affected by both the amount of a chemical product used and the concentration of the subject chemical in the product. First, determine the quantity used per time period (shift, week, month, year). If the chemical of interest is part of a product, then apply the percentage that the chemical constitutes in the product to the total usage of the product to determine the quantity used of that chemical. For example, a product may be a single, pure chemical (such as a solvent), or it may be a dilute water-based mixture, with the active ingredients being only a small percentage of the total amount. The higher the concentration, the higher the potential exposure to that

ingredient. See the Exposure section of the Risk Guide on the DfE website for more information on evaluating the exposure amount and ingredient concentrations.

Exposure Time

In addition to quantity, the duration of contact determines the exposure to a chemical or material. How often is the chemical or material used and for how long? The time period used should be related to that used for quantity. For example, if you measure quantity per month, then the time periods should show how many times (frequency) and for how long (duration) it is used per month. Use whatever time frame works with your business operation, but be consistent.

☞ **Tip**

See the Exposure section of the Risk Guide on the DfE website for more information on evaluating the exposure amount and ingredient concentrations.

Personal Protective Equipment

The use of personal protective equipment (e.g., gloves, eye protectors, breathing masks) can greatly alter exposure to a chemical or substance, for the personal protective equipment provides a barrier that prevents or reduces contact. Even though personal protective equipment is used, some exposure may occur because people are not perfect in their adherence to instructions and because equipment fails. Consider the possibility of failure when making judgments about exposure to chemicals and materials.

Pathways

Substances can come into contact with living organisms through air, water, land, and other solids. For example, chemicals and substances can be inhaled from the air in the form of dust, vapors, and mists. Humans can ingest chemicals and substances in liquids or food. Substances can get into liquids or food by falling into them from the air, or by food coming into contact with chemicals on surfaces or hands. Finally, touching the chemical or substance can occur when dust, mists, or vapors

contact bare skin or when unprotected hands touch contaminated surfaces. Animal and plant life can take up chemicals and substances from the environment in much the same way. Figures 3-c and 3-d show some typical exposure pathways for chemicals used in business operations. When ranking aspects, determine how contact might occur; then decide how severe that contact actually is and how much time is involved (the frequency and duration of contact). (For consistency in comparisons between criteria, apply the same time period to every aspect in your ranking exercise.)

Worksheet 3-2 will help you think about the exposure for each chemical you consider. This chart can be filled in for each chemical or material and represents your best judgment about exposure. The rank for each can then be placed in the last column. The rank represents your judgment.

Worksheet 3-2: Exposure to Chemicals and Materials

Operation	Aspect	Quantity* Used per time period	Exposure Time		Personal Protective Equipment (PPE)	Pathway		Rank Exposed Groups		
			Duration**	Frequency		Human: Inhalation, Dermal, Oral	Environment: air, water, land	Workers	Community	Environ-ment
press cleaning	acetone, toluene, MEK, isopropyl alcohol blend air releases	24 oz. per day	10 min.	5 times per day	gloves	inhalation	air, water	H w/o PPE	L	M-L
Contact Person:				Date Completed:						

*If ingredient in chemical product, use quantity of chemical not product, i.e., apply the percentage that the ingredient makes up of the product.

**How many minutes or hours per day is the chemical or material used?

Note: For more information about evaluating exposure, refer to the exposure section of the Risk Guide on the DfE Program website.

Figure 3-c: Screen Printing Exposure Pathways

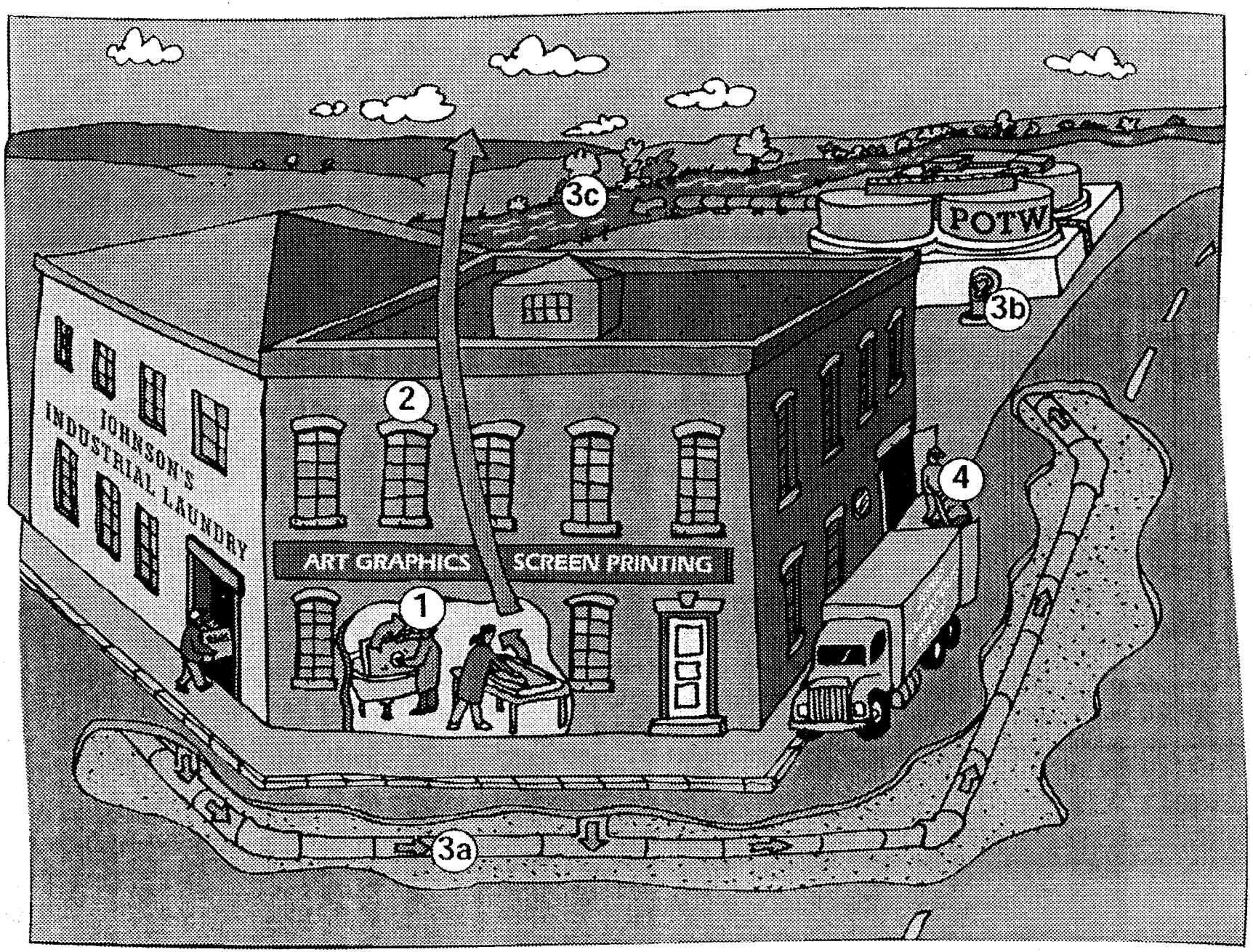
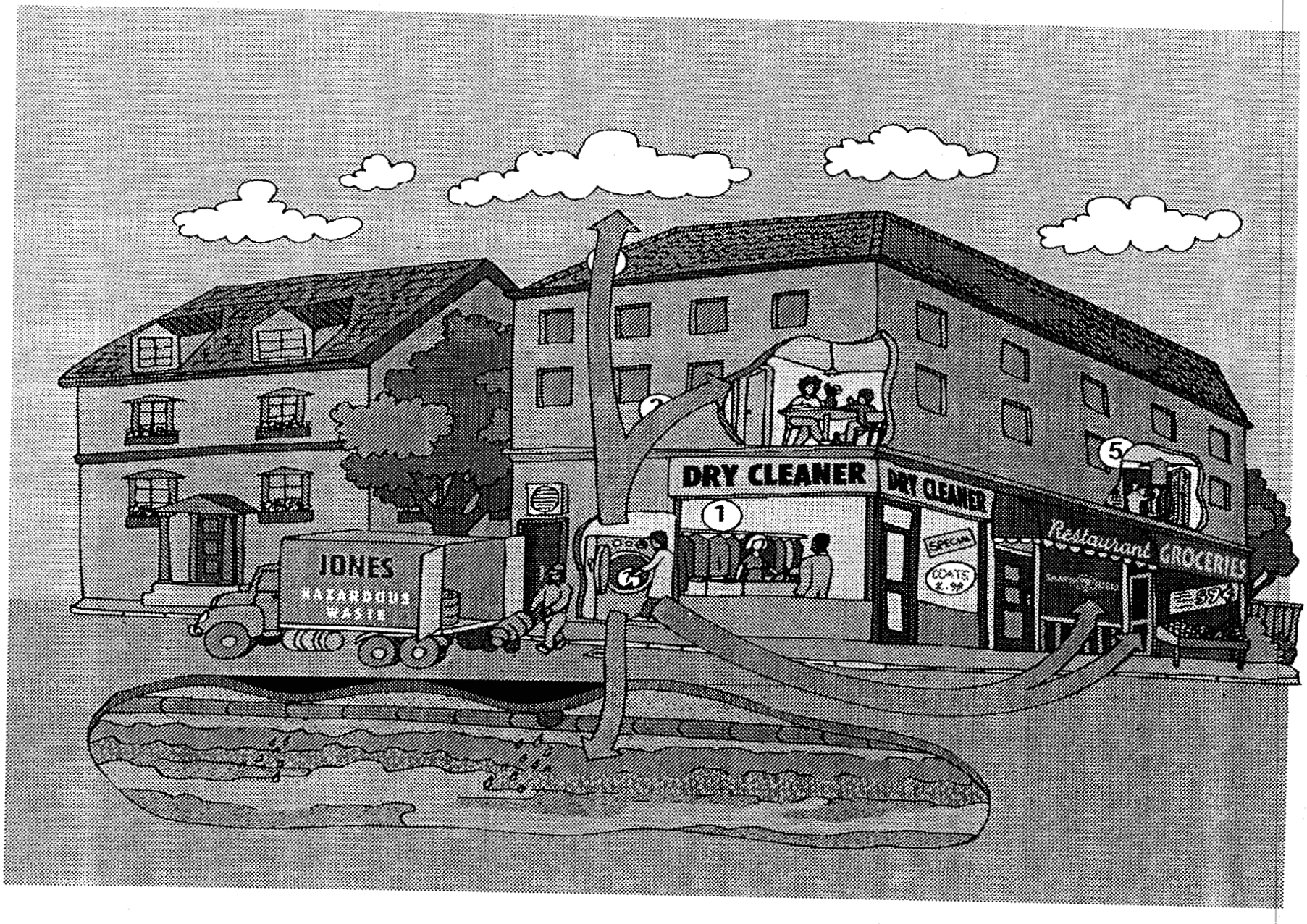


Figure 3-d: Dry Cleaning Exposure Pathways



Ranking Your Significant Environmental Aspects

Now you will put the Effects information together with the Exposure information and consider some additional information. The following paragraphs explain how to use Worksheet 3-3 to rank significant environmental aspects.

Regulatory Concerns

For each aspect, refer to the regulations associated with it that were identified in Module 1 and decide how important these are to your company. For example, an aspect might be regulated, but your company might be small enough that it was exempt from the regulation. The regulatory concern for your company might therefore be considered low (i.e., not important enough for a project). On the other hand, your company might have an environmental aspect to which a regulation applies. If you can stay in compliance easily, you might also rank the regulatory concern low. Or, if the cost of compliance is large or you have experienced difficulties in meeting compliance, you may rank this high (meaning that it may be a good candidate for a project). You do not need at this point to define your aspect in terms of an environmental concern. That will show up as you rank the remaining columns for this aspect.

Chemical and Material Risk

Place both the ranking for effects and the ranking for exposure from Tables 3-1 and 3-2 in the columns. The effects rank for humans would be placed in both the worker and community columns.

Worker Safety

Look at the information in Worksheet 3-1 under worker safety and apply a judgment of ranking. Enter this rank in the worker safety column.

Other Community Issues

There are a variety of community concerns that might affect your designation of a particular activity as a significant aspect. These are issues other than pollution. Some examples are the noise level or odor produced by your plant; increased traffic caused by your business; and increased light needed for your operations. You may come up with others specific to your operation and your community. Worksheet 3-3 provides a place to document and rank these issues. Place the rank from this worksheet in Worksheet 3-5.

Worksheet 3-3: Community Issues

Operation	Aspect	Community Issues (List)	Rank

Contact Person: Date:

Natural Resources

This criterion should be used to identify the use of water, energy, and other environmental resources, such as forests or land. The rank that you give to a particular aspect under this criterion is highly subject to the specific circumstances and values of your company and community. For example, a high rate of water use would be of higher concern in a desert region than in a region where water is more plentiful. This column allows you to consider what resource issues you might associate with a particular aspect. The rank you give is based on your judgment related to your own specific circumstances. Other natural resource issues include generation of solid waste and its contribution to landfills in your area. Worksheet 3-4 provides a place to document and rank these natural resource concerns. Place the rank from this worksheet in Worksheet 3-5.

☞ Tip

Remember: The ranks have no intrinsic meaning. They are merely a shorthand for expressing your judgment about priorities.

Worksheet 3-4: Natural Resources Use

Operation	Aspect	Natural Resources Used	Rank

Contact Person: Date:

Overall Ranking and Significance

Review the columns for each aspect and make a judgment as to whether each aspect should be determined H, H-M, M, M-L, L in rank. After all the aspects have been given an overall rank, determine which of them you believe are significant for your

company. Place a yes (Y) or no (N) in the final column.

Ranking Environmental Aspects: Examples

The following example shows you how to rank the aspects identified in Module 1 using the criteria in Worksheets 3-5a and 3-5b. Examples of both small and large projects are included. It is important that you think through even solutions that seem obvious, because sometimes you might find a better solution. Refer to Figure 1-h and Worksheet 1-5 to refresh your memory on this example.

☞ **Tip**

If you are pursuing ISO 14000 **certification**, you will have to address each significant aspect. You may want to consider reducing the number of significant aspects to two or three in the beginning and add more as your company grows in experience with the IEMS process.

Example 1: Toner Cartridges

In this example, a copy machine is used to make paper copies as part of day-to-day business activities. The inputs are toner, paper, and electricity (energy) to run the copies. Outputs include spent toner cartridges, waste paper from poor quality copies, noise, and usable copies. There are no restrictions on use of the copier. Spent toner cartridges are simply discarded with the office trash.

Let's consider the use of toner in copying. Unused toner is considered as an input, while used toner is considered as an output. The same product generates different concerns at different stages of its use. Let's look at the criteria for each in Worksheet 3-5a. The worksheet shows the aspects identified in Figure 1-h. Only the two toner input and output aspects are scored for this example, for illustration. However, in a real exercise, all the aspects would be scored.

Worksheet 3-5a:[a] Criteria to Determine Significant Aspects—Toner Cartridge Example[b]

Operation	Aspect[b]	Regulatory Concerns	Chemical and Material Risk			Worker Safety	Other Community Issues:[d]	Natural Resources:[e]	Overall Ranking	Significant ? Y/N
			Worker Eff/Exp[c]	Community Eff/Exp[c]	Environment Eff/Exp[c]					
Copying	Paper Use									
	Toner (Input)	M	L/L	L/L	L/L	L		L	M-L	N
	Documents									
	Waste Paper									
	Used toner (Out)	M-H	L/L	L/L	H/H	L		M-H	M-H	Y
	Odors									
Contact Person:					Date Completed:					

[a] Corresponds to SEA-01 in *Company Manual Template.*

[b] Include each input and output of a process step.

[c] Effects/Exposure

[d] Noise, Traffic, Light, Odor.

[e] Include such items as Resource Use, Solid Waste, Energy Use

Ranking Notes for this Example:

Regulatory concerns may be present due to the chemicals used inside the cartridge or due to solid or hazardous waste regulations.

Effects of Chemicals and Materials inside the toner cartridge are probably of concern. You would have identified these in Module 1. However, since the cartridges are not opened either during input or output use, there would be no exposure. Frequency of impact, therefore, would be low.

Workers: Worker health and safety would be of low or no concern if the toner is used only in the cartridges.

Community: The community's health and safety would be of low or no concern if the toner is used only in the

Environment might be high if you do not currently recycle your cartridges. Chemicals can spill out of the cartridges if they are placed in a landfill.

Natural Resource Use would be low for water, but might be a concern for land if you do not recycle the used cartridge.

How to Obtain Overall Rank: this can be done in two ways.

1. Look across the columns and assign a total that in your judgement best reflects the individual ranks in each column.
2. Assign a number from 1-5 to each rank such that H = 5 and L = 1. Sum these across the columns and then divide by the number of columns used to get an average rank for that row. For toner input the total would be 11 (counting each risk column as 2 because they have two scores and disregarding other community issues because it was not applicable). Divide by 9 (the number of columns used). The average rank would be 1.2, which corresponds with M-L. Place M-L in the Total column.

Meaning of Environmental Aspects Rank: The total rank for toner used as an input is M-L and for used toner as an output is M-H. These ranks tell you that toner cartridges as waste outputs of your copying generate more concern than they do as new inputs. Your main concern would be to reduce any potential impact of the used toner cartridges. You could reduce potential impact in at least three ways:

- ensure that the cartridges are not opened either before or after use, to avoid exposure to the chemicals;
- ensure that the cartridges are recycled according to the distributor's instructions, so that there is neither concern for ecological exposure to the chemicals in landfills, nor a contribution to the solid waste going into landfills; and
- reduce the number of waste toner cartridges by cutting down on unnecessary copying.

Example 2: Chemical Use and Waste

A second example will provide more points to consider in developing objectives. Consider the chemical inputs and the chemical waste outputs of a "Press Cleaning" example.

In this example, a printer uses a chemical press cleaner (solvent mixture) to manually clean the press after each print run. An uncovered bucket of cleaner is kept at press-side along with a bin of clean, cloth wipers and an uncovered container of soiled wipers. To clean the press, the printer scrapes excess ink from the press for reuse, dips one or more wipers in the press cleaner and wipes the press; wipes the press with one or more clean, dry wipers; and places soiled wipers in an open bin. Soiled wipers are transferred to a closed storage container at the end of the shift. Most of the resulting ink/solvent mixture is contained on the wipers, but excess is captured in drums and disposed of as a hazardous waste. Soiled wipers are sent to the laundry weekly.

Thus, the inputs are the press cleaner and clean wipers. Outputs are reusable ink, soiled wipers, and waste ink/solvent mixture. The environmental aspects include the waste ink/solvent mixture and air and water emissions of press cleaner. Air emissions of press cleaner occur both in the print shop (from the uncovered bucket of cleaner, the cleaning operation itself, and the storage container of soiled wipers), and at the laundry (from the soiled wipers). We will score the two aspects of chemicals used in press cleaning and waste from those chemicals.

☞ **Tip**

Refer to Figure 1-i and Worksheet 1-5 to refresh your memory on this example.

Worksheet 3-5b:[a] Criteria to Determine Significant Aspects—Chemical Use and Waste Example[b]

Operation	Aspect[b]	Regulatory Concerns	Chemical and Material Risk			Worker Safety	Other Community Issues:[d]	Natural Resources[e]	Overall Ranking	Significant? Y/N
			Worker Eff/Exp[c]	Community Eff/Exp[c]	Environment Eff/Exp[c]					
Press Cleaning	Step 1									
(in)	Toxic chemical constituents	M-H	M/ M-H	M/ M-L	M/ M-L	M-L	n/a	M-H	M	
	Wipers									
	Energy									
	Water									
(out)	Waste chemicals	M-H	M/ M-H	M/ H	M/ H	M-L	n/a	M-H	M-H	
	Soiled Wipers									
	Waste Water									
	Air Releases #1									
	Product for next step									
Contact Person:					Date Completed:					

[a] Corresponds to SEA-01 in *Company Manual Template.*

[b] Include each input and output of a process step.

[c] effects/exposure

[d] Include noise, traffic, light, odor.

[e] Include such items as resource use, solid waste, energy use.

Ranking Notes:

Regulatory Concerns: check the lists of regulations and standards to see if they apply to any of the chemicals you have identified as inputs. For outputs from your manufacturing process, find out whether the regulations for solid and hazardous waste make mention of these chemicals. Consider whether new chemical products are formed and become wastes during the process of step 1. If so, don't forget to check for these chemicals as well as the input chemicals. *Chemical and Material Risk:* Assign the ranks from your Effects and Exposure Worksheets. *Safety* might include reference to a flammable chemical. Hence the rank of M-L. *Natural Resource Use* may be important for both input and output chemicals. Also, consider the quantity of water used as an input or to take care of waste.

Meaning of Rank

The total for input chemicals is M and M-H for output (waste). If you compare all the ranks, it would seem that the waste chemicals in this example, using assumed criteria, constitutes a more significant concern than do the other activities.

Grouping Environmental Aspects

In reviewing your company's list of environmental aspects you may discover that some aspects occur in more than one process step. Energy use is a good example. It might be effective in some circumstances to combine all the process steps having energy aspects, and develop a facility-wide strategy and program for achieving improvement. Understand, however, that the energy aspect should be ranked in each process step to determine its relative importance in that step. For example, energy use in office work might be a different priority than energy use in a manufacturing step. In addition, standards and procedures developed to reduce energy use would be different for each process step. Consequently, although you might achieve certain efficiencies through a facility-wide effort , your actual environmental improvement will be attained through objectives set for each process step.

☞ Tip

You do not have to evaluate alternatives for all significant environmental aspects. Therefore, it is important to consider the "do-ability" of each project and to determine what improvements might be achieved by each project before deciding which ones to undertake.

Consider "Practical" Criteria Also

In order to determine which significant environmental aspects will become projects, it is important to consider the economic and technical feasibility and the time frame for your company. It is also important to consider what improvements could be expected from each project. Selecting high-priority projects is desirable from an environmental perspective, but there is value in undertaking some short term, "easier to implement" projects which may not be ranked high in environmental risk. The easier projects provide a useful learning experience, boost confidence as people see results, and

☞ Tip

Remember: If your company is considering ISO certification, you will have to demonstrate action on every SEA.

focus attention on environmental goals.

In the examples above, deciding to reduce the volume of copying and to recycle toner cartridges used in your office copier is a relatively short-term, low-cost environmental project to set in place as shown in Worksheet 3-6. Determining how to deal with chemical waste products could be a longer process: the obvious solution may not be the best, and a project that appears difficult and long-term may turn out to have a simple solution. The many alternative approaches to dealing with waste products can range from chemical substitutions to changing the nature of the wastes, changing work practices to reduce the volume of the waste, and changing disposal methods. Your final environmental program might include changes in each of these phases. In the example, although ink wastes may have the highest environmental risk rank, addressing those problems could be longer-term and more costly. On the other hand, doing so might yield greater cost savings than the quicker, cheaper toner cartridge example.

You need not rank your practical criteria; you can consider them by simply describing the practical considerations for each potential project. Worksheet 3-6 helps you lay out the considerations for each significant environmental aspect. At this point the worksheet provides you with a "first cut" qualitative judgment, to help choose aspects for further work. Aspects not selected at this time may be suitable for future projects.

Worksheet 3-6: Criteria to Select Environmental Projects

Project to Address Aspect	Time Frame	Cost	Technical Feasibility	Total Feasibility
Toner (In)	N/A	N/A	N/A	N/A
Used Toner (Out)	Short (1 month)	Negligible; time to write procedure	Easy	Excellent
Press cleaner (In)	Longer evaluation	Employee time	Needs help from suppliers, etc.	More difficult
Waste Ink (Out) Soiled Wipers (Out)	Longer evaluation	Employee time, process change	Needs help from suppliers, etc.	More difficult
Contact Person:			Date Completed:	

Finally, compare in general the expected improvements to be gained by working on each aspect. Like any undertaking in a business operation, you should be able to describe what you expect to get before you undertake the project! First, develop a list of benefits criteria. These might include such things as:

- Reduced human health impacts
- Reduced environmental impacts
- Cost savings
- Improved community relations
- Improved employee morale
- Customer benefit

Again, these particular criteria might not fit your company. Make a list of criteria identifying kinds of improvements that could be derived from undertaking environmental projects. These expected improvements need not be ranked; simply describe the potential for each criterion to be achieved. Worksheet 3-7 illustrates the two examples.

☞ Tip

Considering the benefits does not mean undertaking an analysis of potential outcomes. It means identifying the kinds of improvements that might be achieved by implementing a particular project and then deciding what value (priority) that improvement has for your company.

Worksheet 3-7: Potential Improvements

Aspect	Human Health[1]	Environment	Cost Savings	Community Relations	Morale	Expected Improvements
Toner (In)	Little effect	Little	Low	N/A	N/A	N/A
Used Toner (Out)	Some effect through waste	Some effect in waste	Some	Good; shows effort	Good learning tool	Some
Press Cleaner (In)	Improve worker health	Some improve, air	Some through efficiency	Good	Good; workers happy	Good
Waste Ink (Out) Press Cleaner (In) Soiled Wipers (Out)	Improve community; reduce presence of hazardous materials	Improve effect on landfill, groundwater, habitat	Some through efficiency and reduced waste fees	Excellent PR	Good; workers happy	Excellent
Contact Person:					Date Completed:	

[1] Workers, Community, Global

Overall Summary of Ranking

Worksheet 3-8 illustrates how to put together the results from ranking the significant environmental aspects with the results from the economic, technical and improvements worksheets so that you can determine which will make the best projects for your company at this time. Projects not chosen now can be developed later. The example illustrates that while chemical waste may present one of the most involved projects in terms of feasibility, it may also provide the greatest improvements. The final decision rests with your company and should reflect both your values and your needs. You may want to undertake both a short-term and a long-term project.

☞ Tip

It is important to recognize that the tables are merely a tool to help you summarize your judgment and organize your thoughts. The ranks placed in the tables do not have any intrinsic value but are used for purposes of comparing the results to each other.

Worksheet 3-8: Overall Ranking Summary

Process Step Aspect	Aspect Total	Feasibility Total	Benefits Total	Significant Y/N
Toner (In)	M-L	N/A	N/A	
Used Toner	M-H	H	M	N
Chemicals	M	M-L	M-H	
Chemical Waste	H	M-L	H	Y
Contact Person:			Date Completed:	

Setting Objectives

The point of the priority setting exercises, of course, is to reduce your company's impact on the environment. The process outlined in this Guide describes two approaches: making your current activities and processes the best they can be and making significant changes in the products your company uses or produces, and in the processes or activities of your company. If you intend to seek ISO 14000 certification, you will need to take

action on each SEA identified. If you are not seeking certification, you can be more flexible in undertaking projects. Module 4 describes the process of evaluating alternatives for those SEAs you believe will require changes. Module 6 describes the process of developing operational controls for the SEAs that will not involve significant changes at this time. (You may decide to evaluate alternatives and make changes in these later.)

At this point, general objectives can be developed for each SEA identified. These objectives should be consistent with your company's environmental policy and also with your company's compliance requirements. Using the examples ranked on the worksheets above, a company could specify its objectives as follows:

- Reduce the waste from used toner cartridges.
- Reduce the environmental impact of press cleaning.

These objectives state the desired outcome in terms of the desired improvement in environmental impact, not in terms of the specifics of how it might be accomplished. For example, the objective of reducing waste from toner cartridges is open as to how that might be accomplished. One could reduce the use of toner cartridges, ensure that the recycling program is adhered to, or stop using copiers and printers that have toner cartridges in favor of another technology. Likewise, reducing impact from the press cleaning process can be accomplished in different ways.

In looking at these two objectives, one might note that the toner cartridge objective might be met by writing and posting a **procedure** that ensures recycling of the cartridges and by making sure that people who change the toner cartridges have

sufficient *training* in this procedure. On the other hand determining how to reduce the impact of chemical wastes may involve some greater changes that would be provided by operational controls and training *alone*. In this case, an **alternatives evaluation** would be necessary. After an alternative is identified, of course, operational controls and training would be needed for the new product, process or activity.

It is important to take on what you can finish. In the beginning, tackle the SEAs that you can handle, what is environmentally important, and whatever is urgent. Your company can start on any remaining SEAs when you have completed the first ones.

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2.2 Identifying Significant Environmental Aspects and Impacts [ISO 4.3.1, 4.3.2]

What the ISO Standard Requires

The ISO 14001 Standard requires you to have a procedure to identify your environmental aspects. Important considerations:

1) Aspects cause, or could possibly cause, impacts on the environment. These are environmental aspects. Some companies are also including health and safety aspects in their program so they can have a combined Environment, Health, and Safety (EH&S) Management Program, but this is not necessary for registration to the ISO 14001 Standard. It may also complicate the auditing and registration process unless the system is carefully designed.

2) You need to consider your activities (operations), and your products and services. For example, if you provide a shipping service for your customers, that would need to be included along with other operations. Note that you also will need to consider non-routine operations such as maintenance, start-up, shutdown, and emergency conditions (ISO Section 4.4.6) and goods and services that you use (ISO Section 4.4.6 c).

3) Do not include aspects if you cannot control them, or at least have an influence on them. This is a best judgment call. You may revise your decisions over time through the management review process.

4) Rate the preliminary list of aspects based on how significant the impact on the environment is (or would be if it occurred). Significant impacts are given top priority when you establish your environmental objectives and targets, and when you consider your environmental operations and control, including emergency prevention and response. Remember it is not mandatory to set an objective or target for each significant aspect you identify, although they should be at the top of the list to consider. Also remember, that aspects can have positive or beneficial impacts on the environment as well as negative! For example, planting trees around the company's property could be an aspect of your operation that improves air quality and reduces noise pollution.

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Starting Points

Most of the companies in the project had the most difficulty with this section of the standard. Very few small companies have thought through the "big picture" of how their company's business can have a positive or negative impact on the air, water, groundwater, and land of their surrounding communities. As a starting point, most companies can list the environmental permits that they have and relate any routine discharges to significant impacts. Listing types of wastes that are hauled off-site, waste water discharges to Publicly Owned Treatment Works (POTWs), and existing air permits can serve as simple starting points for an emissions inventory. Some small shops are not so certain that they are currently in compliance. A better starting point for them would be to do a preliminary compliance audit including a waste characterization.

Many shops had much less information about aspects of their operations that related to non-routine or incidental activities, particularly with respect to emergency prevention and response, and non-routine maintenance activities such as tank clean-outs. None of the small shops had previously considered the aspects that relate to the goods and services they provide. While most shops collect Material Safety Data Sheets (MSDS) routinely on the goods they purchase—very few had a process for considering the environmental impact of using those goods. None of the small shops had programs to orient outside contractors about requirements to control their activities in accordance with the company's policies.

Implementation Tips

1) Consider starting the process of identifying your impacts (and the aspects of your operations that cause those impacts) by listing all of the environmental emissions you currently are aware of. These include:

   - Wastes you ship off site (whether or not they are reclaimed, or treated). This includes solid hazardous and non-hazardous waste, and any sludge or liquids you ship out.

   - Discharges of water or wastewater to sewers, ponds, lakes, streams, and groundwater. Cooling water should be included, although it may not end up being a significant aspect for your particular facility. This includes wastes you have hauled off site for treatment and/or disposal.

   - Air emissions. Start by noting any hoods, fans, and other ventilation systems that you have in place. Also, consider "fugitive"

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(uncontrolled) emissions from sources such as spray cans, open tanks or pits.

2) Make a list of all of the environmental permits that you currently have and the criteria for compliance. The activities associated with these criteria are the aspects of your operation that are causing (or could cause) significant impacts.

3) Look over your current emergency response plan and your stormwater discharge plans and permits. These will indicate aspects of your operations that could cause non-routine or incidental problems (significant impacts) if there were an accidental spill, leak, or other uncontrolled release of materials or wastes.

4) If you currently have pollution prevention or energy conservation programs in place, add the activities that create the most waste or use the most energy to the list. Use the 80/20 rule here. Generally, people can identify a few significant activities that account for 60-80% of the problems, and do not need to spend time getting details on the rest.

5) List the types of products and services you provide. Could any of these cause significant environmental impacts? One example: if you ship parts to your customers with your own fleet—have you considered ways of reducing the amount of fuel they use by careful scheduling and planning of routes?

6) What about the products and services you purchase. Do you review your material safety data sheets (MSDS) for toxic or hazardous materials? Are there more environmentally friendly alternatives?

7) Consider contractors you use—and note significant impacts from their activities (typically maintenance or construction), but also beware of vendors who routinely bring in uncontrolled samples of materials and leave you to dispose of them.

Examples

1) Common Types of Environmental Impacts

There are a limited number of the common types of environmental impacts that metal finishers should generally consider. Examples of these include:

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1) Impacts on air quality, resulting from the following types of aspects:

- Air emissions from tanks, containers, process lines, dryers, etc.
- Spills and leaks of volatile substances
- Use of energy from power sources that generate air emissions (generators, boilers, lift trucks, heaters, etc.)
- Vehicle emissions (fleet emissions, employee vehicles used for transportation to and from work)

2) Impacts on water quality, resulting from the following types of aspects:

- Wastewater discharges from process lines, parts washers, grinders, etc.
- Cooling water discharges and cooling tower discharges
- Liquid process maintenance waste from tank clean out, boiler blow-down, etc.
- Spent process fluids (plating solutions, cleaners, hydraulic fluid, lubricants, coatings, etc.)
- Spills and leaks that enter sewer or drain systems (interior floor drains, roof drains, parking lots, loading docks, etc.)
- Non-point discharges from maintenance of parking lots, grounds (fertilizers, pesticides)

3) Impacts on ground/soil quality, resulting from the following types of aspects:

- Hazardous and solid waste shipped off-site for land disposal
- Spills and leaks that contaminate soils around the facility
- Run-off from parking lots and grounds (salt, fertilizers, oils, etc.)
- Leaks underneath the facility caused by improperly designed or poorly maintained flooring materials

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- Leaks from poorly designed or maintained underground storage tanks

4) Impacts on groundwater quality, resulting from the following types of activity:

   - Contamination of aquifers caused by discharges to soil (see the above aspects)
   - Discharges of liquid process waste into poorly designed or maintained underground injection wells
   - Use of cooling and process water from underground aquifers
   - Leaks resulting from poorly designed or maintained lagoons, surface impoundments, catch basins, etc.
   - Leaks from underground storage tanks

5) Non-renewable resource use, resulting from the following types of aspects:

   - Use of energy generated from non-renewable sources
   - Materials use (metals, cleaners, solvents, etc.)
   - Water use (process, cooling, cleaning, etc.)
   - Use of paper, cardboard, plastics (packing materials, masking materials, office wastes, cafeteria wastes, etc.)

6) Other environmental quality issues, resulting from the following types of aspects

   - Visual impairments due to facility lights, noise, odors, traffic flow, etc.
   - Improved environmental awareness of surrounding community due to external communication programs
   - Reduced traffic flow through the area due to employee car-pooling efforts
   - Site improvement projects such as tree planting, clean-up campaigns for surrounding areas (parks, streams, fields), hiking and biking trails, etc.

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2) Methods for identifying aspects

Most companies used a cross-functional team to identify their aspects.

> "The environmental manager assembles a cross-functional team to perform the evaluation. The team may include representatives from environmental, health & safety, product design, line management, maintenance, and shipping/receiving, or other functions as appropriate. Separate teams may be formed to evaluate particular groups of products, activities, and services. The team may call upon other individuals in the organization as appropriate."

A "plant walk through" was a common element required in all procedures. Some plants developed checklists to help guide the process, using checklists similar to Example 2.2.1.

> "The Core Group and the shop personnel shall consider all aspects of the physical areas during the Facility Walk-through of the organization's products, services, and activities, including (where appropriate): shipping/receiving, storage/handling, offices/labs, manufacturing/production, maintenance, emissions, waste treatment, all general areas."

Example 2.2.1 Walk-through Checklist

Impact	Aspect	Typical Functional Areas
Air Quality	Air Emissions	☐ Plating Operations ☐ Coating Operations ☐ Part Drying ☐ Rack Stripping
Surface Water/Soil Contamination	Spill, Leaks Reactions/Explosions Storm water Discharge	☐ Chemical Storage Area ☐ Shipping Receiving Areas ☐ Chemical Handling ☐ Maintenance
Water Contamination	Wastewater Discharge	☐ Plating Lines ☐ Waste Treatment Plant ☐ Rack Stripping
Hazardous Waste Sent to Landfill (soil/water contamination)	Sludge Disposal Drum and Packaging Disposal Container Disposal	☐ Shipping & Receiving ☐ Waste Treatment Plant ☐ Maintenance
Non-Renewable Resource Utilization	Energy Use	☐ Plating Lines ☐ Part Drying ☐ Shipping ☐ Plant Utilities (Air Compressors, Blowers)
Resource Utilization	Metals Use Water Use	☐ Plating Lines ☐ Plant Utilities (DI Water Units, Coolers, Chillers)

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Some companies also completed process flow charts for significant operations.

> "To complete the aspects identification process, XYZ's next step will be to conduct a more detailed aspects identification for each process. In order to establish some preliminary targets the following three aspects have undergone a more thorough process, which will be used throughout the facility. The following three were selected due to the fact that pollution prevention/waste minimization initiatives were either in progress or planned for these aspects."

3) Methods for Updating the List of Aspects and Impacts

Most companies decide whether to update the aspect list during the Management Review process.

> "The results of the most recent environmental aspect/impact identification are reviewed as part of the Management Review process (See Procedure EMS-4.6). Based on this review, XYZ's management determines the need to update the environmental aspect evaluation. Factors such as improved assessment methodologies, or major changes to the organization's mission, products, and processes are considered in determining the need to update the assessment."

Additionally, some call for an annual review by an Environmental Planning Team of the entire operation. Changes in equipment or processes are reviewed for aspects and impacts before they are implemented.

> "The annual walk-through will provide a baseline assessment and up-to-date information on environmental aspects and impacts for XYZ."
>
> "New processes and equipment will be reviewed in relation to their environmental aspects and impacts prior to being put into use."

4) Methods for Screening for Significant Aspects

A common scoring mechanism used a combined score based on a subjective determination of the frequency and severity of impact. For an example of how this was done, see Example 2.2.2.

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Example 2.2.2 Sample Aspect Scoring Worksheet

XYZ Company has identified "Spills from Unloading Trucks" as an environmental aspect of their operations. They used the following worksheet to determine whether the impact (on water quality and/or soil contamination) is (or would be) significant. First, they determined that the LIKELIHOOD of a spill was low (they hadn't had any spills of this type in the previous three years). Second, they determined that the MAGNITUDE (or severity) of the impact would be moderate for most of the types of materials they received. However, they also noted that certain chemicals are regulated and that reportable quantities would require them to make the appropriate response to environmental regulators.

Using the "Key to Impact Rating", an aspect with a Low Likelihood and a Moderate Magnitude received an overall score that makes it a low significance aspect.

Area	Aspect	Impacts	Impact Score:		Significance
			Likelihood	Magnitude	
Shipping Dock	Spills from Unloading Trucks	Water Quality Soil Contamination	Low	Moderate	LOW - (but spills of reportable quantities of certain chemicals are regulated)
			OVERALL SCORE: Low Significance		

KEY TO IMPACT RATING

Likelihood of Occurrence of Impact	Magnitude (severity of environmental impact, actual or potential)		
	Severe	Moderate	Mild
High	High Significance	High Significance	Medium Significance
Medium	High Significance	Medium Significance	Low Significance
Low	Medium Significance	Low Significance	Low Significance

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Other worksheets used by the companies included additional factors that may be considered in the screening process. For example: Cost to Accomplish, Environmental Concern (Risk to Facility), Feasibility of Technology may also be included in determining whether the aspect is significant.

Example 2.2.3 Significant Impact Screening Worksheet

Aspect	Size of Impact	Cost to Accomplish	Environmental Risk?	Achievable?	Significant Aspect?
Energy Use	High Impact	$50K - $100K with a 1.2 year payback	No	Yes	Yes
Solid Waste-disposal of packaging material	Low Impact	Unknown	No	Unknown	No

Conformance Check

All the metal finishers had a good understanding of the broad scope of environmental aspects; that an examination of environmental aspects pertains not just to products but also to the activities and services of an organization. Several of the procedures clarified what was meant by activities:

> "Activities are those activities that are not directly linked to a specific product, service or activity (such as equipment maintenance). Activities that are directly linked to the manufacturer of a particular product are evaluated when the product is evaluated."

The ISO 14001 standard requires the identification of only those environmental aspects over which the organization does have influence or may be expected to have influence. One company clarified this point of conformance with the following statement in their environmental aspect identification procedure:

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"Environmental aspects are generally limited to those areas over which the facility has some degree of control. To limit the aspect identification to areas over which XYZ Corp. has control, we have defined boundaries to our environmental aspects on the output (product) side. Because XYZ Corp. produces components for customers who will use them in the manufacture of a finished product, we are defining the boundary of XYZ Corp.'s aspects as the end of their finishing process (including packaging and shipping). For example, the environmental aspects of a chrome-plated automobile bumper will end (for XYZ Corp.) with the shipment of that bumper from XYZ Corp. to the customer's facility, and will *not* include the environmental aspects of the life cycle of the automobile to which the bumper will be attached."

Keeping the aspects information up-to-date is often an area companies overlook or fail to implement. As noted in Methods for Updating the List of Aspects and Impacts in the Examples section above, linking a review of aspects to another part of your EMS (such as the Management Review, changes in operations, or new or modified products) helps to ensure that the list of aspects and impacts is current and that your company remains in conformance with the standard.

EMS Links

When you modify, add, or delete environmental aspects, the following parts of your EMS may also be affected and should be reviewed and revised as necessary.

- Objectives and targets: Aspects and objectives are closely linked in your EMS. The standard requires that aspects be *considered* when determining and reviewing environmental objectives. You *are not* required to have an objective for every aspect identified. Aspects are only one input into setting or revising objectives. Other factors include legal and other requirements, technological options, financial considerations, operational and business requirements, and the views of interested parties.

- Environmental management program: The link between aspects and the environmental management program is more indirect. If an aspect does result in an objective, which does require an environmental management program, then the objective and its associated program should be reviewed if the aspects change.

- Training, awareness, and competence: Identifying environmental aspects is the first step in determining significant impacts. Significant impacts are noted several times in the requirements for environmental training:

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- significant impacts are a key criteria in determining who receives environmental training

- direct training on the significant impacts of work activities is required

- personnel whose work is tied to a significant environmental impact are required to be competent to do their job

- Communication: The environmental aspects and the entire EMS together form the basis for the communication of environmental information within your organization. You are required to have a process for responding to inquiries, comments, and other forms of communication from external parties. The standard does not require your company to publicly disclose information on your significant aspects. It says only that you must consider a process for the external communication of significant aspects and document your decision.

- Operational control: Significant aspects related to the policy and objectives and targets are used to determine which operations and activities within your company require written (or "documented procedures") operational control procedures.

- Monitoring and measurement: The link between aspects and monitoring and measurement is through significant impacts. Aspects again direct you to the parts of your operation requiring written procedures. The standard requires written procedures to monitor and measure operations and activities that can have a significant impact on the environment.

ELEMENT 2.1

ENVIRONMENTAL ASPECTS AND IMPACTS

How does your C/U interact with the environment? The fundamental purpose of the EMS is to control and reduce the environmental impacts of your C/U's activities and procedures. For this reason, a critical element of the EMS involves identifying and prioritizing the environmental aspects and impacts associated with your school. Using the concept from the Introduction of your C/U's "environmental footprint," identifying aspects is akin to taking a picture of your "foot," while determining impacts is analogous to gauging the effect, or "footprint," of your step. **An environmental aspect is an element of an organization's activities, products, or services that can interact with the environment (ISO 14001 definition).** Aspects may have an **impact** defined as, "Any change to the environment...wholly or partially resulting from an organization's activities, products, or services," (ISO 14001 definition). Examples of C/U activities, aspects, and impacts are provided below.

In simplest terms:

Cause → Effect
|| ||
Aspect → Impact

Activity	Aspect	Impact
Food Service	◆ Electricity Use ◆ Water Use ◆ Solid Waste ◆ Food Waste	◆ Air Pollution ◆ Resource Consumption (water, energy, food) ◆ Landfilling ◆ Landfilling
Grounds Maintenance	◆ Fuel Use ◆ Pesticide/Fertilizer Use ◆ Green Waste	◆ Air Pollution ◆ Pollutant Runoff ◆ Compost

Assessing environmental aspects and impacts on a C/U campus can be particularly difficult. The complex organizational structure of the many C/U entities involved in the EMS can make the identification and prioritization of environmental aspects and impacts challenging. Furthermore, because C/Us operate like a small community, a wide variety of activities exist, each with its own set of aspects and impacts. While it is important to accurately identify environmental aspects and impacts, it can be easy to get caught up in the evaluation and delay progress of the EMS. There are many ways to complete an aspects and impacts review that are well documented elsewhere (see "EMS Resources" in Appendix A). This Implementation Guide focuses on getting your EMS started quickly to gain momentum, establishing a systematic approach that

Procedure for Determining Criteria for Significant Aspects (Unofficial)

- Call everyone together and sit down
- Have coffee and donuts
- Brainstorm
- Listen, listen, listen
- Record

- Rich LeMoine
University of Massachusetts, Lowell

works for your C/U, and revisiting the aspects and impacts review later in a more far-reaching manner. The following questions should be considered when identifying aspects and impacts:

Identifying Aspects	Evaluating Impacts
• Which activities and services interface with the environment in a way that could result (or has resulted) in environmental impacts? • What materials, energy sources, and other resources are used in regular operations? • What are the primary sources of emissions to the air, water, or land? • What are the primary types of waste produced? What are the primary sources associated with each waste? Does the treatment or disposal of these wastes have potential environmental impacts? • How does our land or infrastructure (such as buildings and campus grounds) interact with the environment? • Which activities (for example, chemical or fuel storage) might lead to accidental releases?	• Are the impacts actual or potential? • Are the impacts beneficial or damaging to the environment? • What is the magnitude or degree of these impacts? • What is the frequency or likelihood of these impacts? • What is the duration and geographic area of these impacts? • Which parts of the environment might be affected (for example, air, water, land, flora, or fauna)? • Is the impact regulated in some manner? • Have parties internal or external to the C/U expressed concerns about these impacts?

Source: Adapted from Environmental Management Systems: An Implementation Guide for Small and Medium-sized Organizations, NSF International, 2001

Once your C/U's environmental aspects and impacts have been identified, you face the challenge of evaluating and prioritizing each one. Because of the varied aspects and impacts found at a C/U, this process can be intimidating. **This Implementation Guide includes two steps to systematically identify, prioritize, and document aspects and impacts.** The first approach is designed to initiate general analysis of your C/U's aspects and impacts, while the second evaluates each aspect and impact for specific C/U activities in greater detail. Use the approaches in a way that works best for your organization. This process is particularly important because high-priority environmental aspects and impacts will be targeted when environmental objectives and targets are established.

Implementation: *Procedure 2.1, Environmental Aspects and Impacts*, describes how to identify and document your C/U's priorities. This Implementation Guide includes two steps in evaluating your C/U's aspects and impacts. A summary of the tools provided and an explanation of their use is provided below:

Environmental Aspects Assessment -- Form A: The first step uses detailed, structured matrices (Form A) to help catalogue and quantify environmental aspects and impacts. At an EPA Region 1 C/U EMS conference in September 2000, the following four C/U activities were identified to be of greatest concern in a survey of C/U environmental health and safety personnel:

- Laboratories
- Energy Use
- Janitorial Operations
- Fleet Operations

ENVIRONMENTAL ASPECTS ASSESSMENT – FORM A

ENVIRONMENTAL ASPECTS – JANITORIAL OPERATIONS

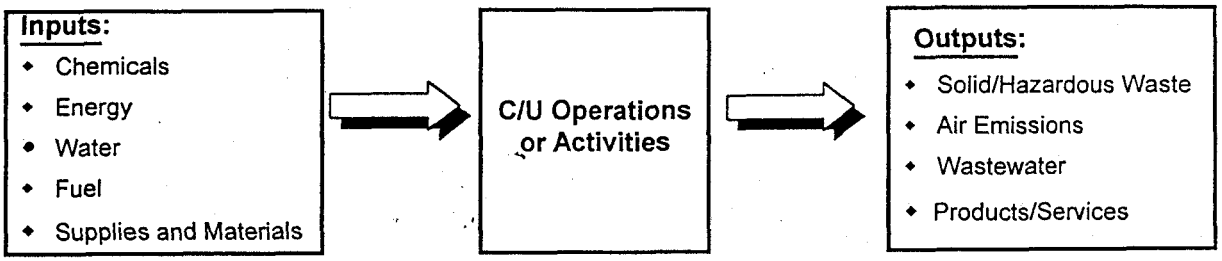
ACTIVITY OR OPERATION	COMMON CONCERNS	USE RATE PER MONTH	REDUCTION EFFORTS
BATHROOM CLEANING ✓ Toilet Bowl Cleaners ✓ Disinfectants	☐ Hydrochloric acid ☐ Phosphoric acid ☐ Sulfamic acid ☐ Other acid ☐ 2-Butoxy ethanol ☐ Isopropyl alcohol ☐ Other toxic ingredients[4]		☐ "Environmentally Preferable" Product[1] ☐ Dilute ☐ Use Reduction and Minimization Method[2] ☐ Other: _____
FLOOR CARE ✓ Carpet Cleaners ✓ Floor Finish ✓ Hard Floor Care	☐ Carcinogens / Neurotoxins[3] ☐ Solvents ☐ VOCs ☐ Other toxic ingredients		☐ "Environmentally Preferable" Product ☐ Dilute ☐ Use Reduction and Minimization Method ☐ Other: _____

This Implementation Guide provides matrix tools for these four activities; however, your institution should evaluate others, as is appropriate for your C/U. Other C/U activities likely to have environmental aspects of significant concern identified in the same survey include:

- ✓ Printing
- ✓ Art Department
- ✓ Construction and Demolition
- ✓ Food Service and Campus Dining
- ✓ Buildings & Grounds Maintenance
- ✓ Hazardous Waste Management
- ✓ Painting of Buildings and Equipment
- ✓ Computer and Information Systems
- ✓ Water Use
- ✓ Wastewater Treatment
- ✓ Solid Waste Management

Form A is generally organized around a C/U's activities and operations to incorporate a "system-by-system" analysis and prioritization across the entire C/U. Further, Form A is structured to couple help identify the sources of the aspects. A useful approach for tackling activities for which no Form A is included (see common activities listed above) is to identify and list the various inputs (resources) as well as related outputs (waste) from a given activity. This method simulates a "material balance" approach to encourage a holistic, rather than splintered, analysis.

Each environmental aspect and impact form is designed to document the source of each aspect, which should encourage you to consider source reduction (pollution prevention) strategies for mitigating the aspect and its impact.



Form A can help your EMS Team evaluate and document environmental aspects and impacts, enabling your team to objectively compare the environmental affects of C/U operations.

Aspects and Impacts Form B – Form B should be used to compile the more detailed analysis from Form A, and (1) identifies the impacts associated with the aspects identified in Form A and (2) prioritizes the top 5 aspects and impacts relative to each other. Form B can be revisited regularly to update your top 5 aspects and impacts. Form B includes several example criteria by which to prioritize your top 5 environmental aspects and impacts; one way to prioritize environmental aspects and impacts using Form B is as follows:

ENVIRONMENTAL ASPECTS ASSESSMENT SUMMARY – FORM B

TOP 5 ENVIRONMENTAL ASPECTS AND IMPACTS

For each aspect and impact, score each prioritization criterion on a scale from 1 to 5, where 1 indicates the criterion is very important or relevant to that aspect (for example, the aspect is strictly regulated, is the subject of compliance violations, or is a waste generated in large quantities), and 5 indicates the criterion is relatively unimportant or irrelevant to that aspect (for example, the aspect is an unregulated waste, is generated infrequently, and is inexpensive to manage).

Aspect	Impact	Sources	Quantity and Cost	Prioritization Criteria	Score (Σ of scores)
1.				_____Regulatory compliance _____Human health/exposure risk _____Toxicity _____Source value/cost _____Quantity _____Treatment/prevention cost	
2.				_____Regulatory compliance _____Human health/exposure risk _____Toxicity _____Source value/cost _____Quantity _____Treatment/prevention cost	

Step 1:

For each aspect and impact, score each prioritization criterion on a scale from 1 to 5, where 1 indicates the criterion is very important or relevant to that aspect (for example, the aspect is strictly regulated, is the subject of compliance violations, or is a waste generated in large quantities), and 5 indicates the criterion is relatively unimportant or irrelevant to that aspect (for example, the aspect is an unregulated waste, is generated infrequently, and is inexpensive to manage).

Step 2:

Add the scores of all criteria for each aspect and write the total in the right-most column of the form. This number indicates the relative priority of the aspect compared to other aspects and impacts in the same category. The lower the total score, the higher the priority.

SAMPLE PROCEDURE ONLY – REVISE AS NEEDED

	EMS Procedure	2.1
	Effective Date	
[C/U Name]	Subject	**Environmental Aspects and Impacts**

Purpose This procedure is used to identify, document, and update the environmental aspects and impacts of the [C/U Name] activities and services.

Step 1 The EMS Manager and other EMS Participants selected by the EMS Manager are responsible for identifying and prioritizing the environmental aspects and impacts of [C/U Name] operations during EMS planning and development.

Environmental aspects are characteristics of [C/U Name] operations that interact with the environment. Only environmental aspects the [C/U Name] can control or influence will be considered.

Environmental impacts are the effects of a [C/U Name] activities or services on the environment.

Step 2 Environmental aspects and impacts will be documented and prioritized using Aspects Forms A and B and other methods, as listed below:

- _____
- _____
- _____

Additional environmental aspects relevant to the [C/U Name] operations will be evaluated as needed. High-priority environmental aspects and impacts will be considered when environmental objectives and targets are set.

Step 3 The EMS Manager and other EMS Participants will review and update the environmental aspects and impacts documentation annually.

Step 4 Environmental aspects and impacts documentation will be retained at the [C/U Name] for at least 2 years.

Responsible Person: _____

Signature and Date: _____

ENVIRONMENTAL ASPECTS – LABORATORIES

DEPARTMENT:_____ **LAB SUPERVISOR:**_____

TYPE OF LAB: ❑ Chemistry ❑ Biological Sciences ❑ Physical Sciences ❑ Medical Science ❑ Engineering/Physics

▪			❑
			❑
▪			❑
▪			❑
▪			❑
▪			❑
▪			❑
▪			❑
▪			❑
▪			❑
▪			❑

Note: [1] Per Toxic Substance Control Act (TSCA); Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA); Centers for Disease Control (CDC); and National Research Council (NRC) standards and guidance.

_____
Responsible Person

_____
Effective Date

ENVIRONMENTAL ASPECTS – JANITORIAL OPERATIONS

ACTIVITY OR OPERATION	COMMON CONCERNS	USE RATE PER MONTH	REDUCTION EFFORTS
BATHROOM CLEANING ✓ Toilet Bowl Cleaners ✓ Disinfectants	❑ Hydrochloric acid ❑ Phosphoric acid ❑ Sulfamic acid ❑ Other acid ❑ 2-Butoxy ethanol ❑ Isopropyl alcohol ❑ Other toxic ingredients[4]		❑ "Environmentally Preferable" Product[1] ❑ Dilute ❑ Use Reduction and Minimization Method[2] ❑ Other: _____
FLOOR CARE ✓ Carpet Cleaners ✓ Floor Finish ✓ Hard Floor Care	❑ Carcinogens / Neurotoxins[3] ❑ Solvents ❑ VOCs ❑ Other toxic ingredients		❑ "Environmentally Preferable" Product ❑ Dilute ❑ Use Reduction and Minimization Method ❑ Other: _____
FIXTURE/FURNITURE CLEANING ✓ Furniture Polish ✓ Metal Cleaner ✓ General Purpose Cleaners	❑ 2-Butoxy ethanol ❑ Isopropyl alcohol ❑ Chlorinated solvents ❑ Hydrocarbon solvents ❑ Other toxic ingredients		❑ "Environmentally Preferable" Product ❑ Dilute ❑ Use Reduction and Minimization Method ❑ Other: _____
GLASS CLEANING o Glass Cleaners	❑ 2-Butoxy ethanol ❑ Isopropyl alcohol ❑ Other toxic ingredients		❑ "Environmentally Preferable" Product ❑ Dilute ❑ Use Reduction and Minimization Method ❑ Other: _____

Notes:

1 Environmental Preferable Product refers to an alternative product that eliminates or minimizes common chemicals of concern.

2 Minimize use of product by only using product when needed, rather than following predetermined schedule. Also, minimize exposure through use of personal protective equipment and/or alternative product forms (for example, trigger vs. aerosol container).

_____

Responsible Person

_____

Effective Date

ENVIRONMENTAL ASPECTS – JANITORIAL OPERATIONS

[3] See Occupational Safety and Health Administration's website: http://www.osha-slc.gov/SLTC/carcinogens/index.html or U.S. Department of Health Information Service National Toxicology Program's website: http://ehis,niehs.nih.gov/roc for a listing of known carcinogens.

[4] See the Janitorial Pollution Prevention Project's website for listing of potentially harmful chemicals: www.westP2net.org/janitorial/jp4.htm

ENVIRONMENTAL ASPECTS – ENERGY USE*

Activity or Operation	Common Sources	Use Rate per Month (therms or kw/mo and $/mo)	Reduction Efforts
Computers / Information Systems	❑ Personal Computers ❑ Servers		❑ Auto-sleep mode ❑ Shut-down enforcement ❑ Lab Management
Heating and Cooling	❑ Air Conditioners ❑ Furnaces ❑ Fans ❑ Boilers and Water Heaters		❑ System upgrades ❑ Insulation / windows ❑ Temperature controls ❑ O&M BMPs
Laundry	❑ Residential Hall Laundry Facilities ❑ Hospital/Laboratory Laundry Facilities		❑ System upgrade ❑ O&M BMPs ❑ Lab Management
Lighting	❑ Residential Hall Lighting ❑ Classroom Lighting ❑ Offices / Admin Lighting ❑ Outdoor Lights ❑ Laboratory ❑ On-campus Commercial		❑ Sensor Controls ❑ Delamping ❑ High efficiency bulbs ❑ Relamping ❑ Tandem wiring
Lab Equipment	❑ Spectrometers ❑ Ovens ❑ Hoods ❑ Cleaning Equipment ❑ Microscopes		❑ O&M BMPs ❑ Technology upgrade
Refrigeration	❑ Food Service / Campus Dining ❑ Vending Machines ❑ Laboratory Cooling Needs ❑ On-campus Commercial		❑ Coil maintenance ❑ System upgrade ❑ O&M BMPs

_____

Responsible Person

_____

Effective Date

ENVIRONMENTAL ASPECTS – ENERGY USE

Notes:

- While it is very difficult to inventory energy use, it is important to identify primary sources of consumption and to evaluate reduction options.
- [1] Laboratory management can affect energy consumption (for example, computer laboratory hours from 24 hours per day to 18 hours per day cuts overhead energy consumption by 2,190 hours per year).

Responsible Person

Effective Date

ENVIRONMENTAL ASPECTS AND IMPACTS: ENERGY USE
EXAMPLE

Activity or Operation	Common Sources	Use Rate per Month (therms or kw/mo and $/mo)	Reduction Efforts
Computers / Information Systems	☐ Personal Computers ☐ Servers ☐ Computer Lab Operation Overhead	156,250 kw/month $25,000 mo	☑ Auto-sleep mode ☐ Shut-down enforcement ☑ Lab Management
Heating and Cooling	☐ Air Conditioners ☐ Furnaces ☐ Fans ☐ Boilers and Water Heaters	390,625 kw/month $62,500 month	☐ System upgrades ☐ Insulation / windows ☑ Temperature controls ☑ O&M BMPs
Laundry	☐ Residential Hall Laundry Facilities ☐ Hospital/Laboratory Laundry Facilities ☐ Facility Operation Overhead	187,500 kw/month $30,000	☐ System upgrade ☑ O&M BMPs ☐ Lab Management
Lighting	☐ Residential Hall Lighting ☐ Classroom Lighting ☐ Offices / Admin Lighting ☐ Outdoor Lights ☐ Laboratory ☐ On-campus Commercial	312,500 kw/month $50,000 month	☑ Sensor Controls ☐ Delamping ☑ High efficiency bulbs ☐ Relamping ☐ Tandem wiring
Lab Equipment	☐ Spectrometers ☐ Ovens ☐ Hoods ☐ Cleaning Equipment ☐ Microscopes	109,375 kw/month $17,500	☑ O&M BMPs ☐ Technology upgrade
Refrigeration	☐ Food Service / Campus Dining ☐ Vending ☐ Laboratory Cooling Needs ☐ On-campus Commercial	234,375 kw/month $37,500 month	☐ Coil maintenance ☑ System upgrade ☐ O&M BMPs

Responsible Person

Effective Date

ENVIRONMENTAL ASPECTS AND IMPACTS: FLEET OPERATIONS

ACTIVITY OR OPERATION	COMMON CONCERNS	USE RATE PER MONTH	REDUCTION EFFORTS
CLEANER / DEGREASERS ✓ Brake Cleaners ✓ Carburetor Cleaners ✓ Engine Cleaners	❑ Carcinogens / Neurotoxins[1] ❑ Solvents ❑ VOCs		❑ "Environmentally Preferable" Product[2] ❑ Aqueous Product ❑ Non-aerosol ❑ Decrease/Eliminate Usage ❑ Other: _____
Lubricants and Penetrants ✓ WD-40 ✓ Silicone Spray	❑ Carcinogens / Neurotoxins ❑ Petroleum Distillates ❑ VOCs ❑ Other Toxic Ingredients		❑ "Environmentally Preferable" Product ❑ Non-aerosol ❑ Other: _____
Coolants ✓ Ethylene Glycol ✓ Propylene Glycol	❑ Heavy Metals ❑ Surface Water Pollutants		❑ "Environmentally Preferable" Product ❑ Extended Life Formulations (Organic Acid Technology)
Oil, Grease, Fluids ✓ Engine Oil & Grease ✓ Brake and Trans. Fluid	❑ Heavy Metals ❑ Other Toxic Ingredients		❑ Recycled ❑ Extend Oil Life ❑ Other: _____
Glass Cleaners ✓ Windshield Fluid / Solvent ✓ Auto Glass Cleaner	❑ Methanol ❑ Isopropyl Alcohol ❑ Other Toxic Ingredients		❑ "Environmentally Preferable" Product (Aqueous) ❑ Dilute ❑ Non-aerosol ❑ Other: _____
Parts Washers ✓ Mineral Spirits Solutions ✓ Aqueous Solutions	❑ Carcinogens / Neurotoxins ❑ Petroleum Distillates ❑ VOCs ❑ Other Toxic Ingredients		❑ "Environmentally Preferable" Product (Aqueous) ❑ Extend Solvent Life ❑ Non-aerosol ❑ Decrease/Eliminate Usage ❑ Other: _____

_____
Responsible Person

ENVIRONMENTAL ASPECTS AND IMPACTS: FLEET OPERATIONS

ACTIVITY OR OPERATION	COMMON CONCERNS	USE RATE PER MONTH	REDUCTION EFFORTS
VEHICLE BODY CLEANING ✓ Detergents / Soaps ✓ Spot Remover	❑ VOCs ❑ Solvents ❑ Other Toxic Ingredients		❑ "Environmentally Preferable" Product ❑ Dilute ❑ Non-aerosol ❑ Decrease/Eliminate Usage ❑ Other: _____
FUEL SYSTEM MAINTENANCE ✓ Fuel Injector Cleaner ✓ Engine Treatment	❑ Solvents ❑ Hexane, Xylenes, Benzene ❑ VOCs ❑ Other Toxic Ingredients		❑ Decrease/Eliminate Usage ❑ Other: _____
PAINTING AND BODY WORK* ✓ Paints ✓ Primers & Sealers	❑ Carcinogens / Neurotoxins ❑ VOCs ❑ Heavy Metals ❑ Other Toxic Ingredients		❑ "Environmentally Preferable" Product (Low VOC) ❑ Application Techniques ❑ Other: _____

Notes:

1 Environmental Preferable Product refers to an alternative product that eliminates or minimizes common chemicals of concern.

2 Minimize use of product by only using product when needed, rather than following predetermined schedule. Also, minimize exposure through use of personal protective equipment and/or alternative product forms (for example, trigger vs. aerosol container).

* May not be performed on site.

_____

Responsible Person

_____

Effe... Date

ENVIRONMENTAL ASPECTS ASSESSMENT SUMMARY - FORM B

TOP 5 ENVIRONMENTAL ASPECTS AND IMPACTS

For each aspect and impact, score each prioritization criterion on a scale from 1 to 5, where 1 indicates the criterion is very important or relevant to that aspect (for example, the aspect is strictly regulated, is the subject of compliance violations, or is a waste generated in large quantities), and 5 indicates the criterion is relatively unimportant or irrelevant to that aspect (for example, the aspect is an unregulated waste, is generated infrequently, and is inexpensive to manage).

Aspect	Impact	Sources	Quantity and Cost	Prioritization Criteria		Score (Σ of scores)
1.				_____Regulatory compliance _____Toxicity _____Quantity	_____Human health/exposure risk _____Source value/cost _____Treatment/prevention cost	
2.				_____Regulatory compliance _____Toxicity _____Quantity	_____Human health/exposure risk _____Source value/cost _____Treatment/prevention cost	
3.				_____Regulatory compliance _____Toxicity _____Quantity	_____Human health/exposure risk _____Source value/cost _____Treatment/prevention cost	
4.				_____Regulatory compliance _____Toxicity _____Quantity	_____Human health/exposure risk _____Source value/cost _____Treatment/prevention cost	

_____

Responsible Person

_____

ENVIRONMENTAL ASPECTS ASSESSMENT SUMMARY - FORM B

TOP 5 ENVIRONMENTAL ASPECTS AND IMPACTS

Aspect	Impact	Sources	Quantity and Cost	Prioritization Criteria	Score (Σ of scores)
5.				_____Regulatory compliance _____Toxicity _____Quantity _____Human health/exposure risk _____Source value/cost Treatment/prevention cost	

_____
Responsible Person

_____
Effective Date

ENVIRONMENTAL ASPECTS ASSESSMENT SUMMARY - FORM B

TOP 5 ENVIRONMENTAL ASPECTS AND IMPACTS
EXAMPLE

Aspect	Impact	Sources	Quantity and Cost	Prioritization Criteria		Score (Σ of scores)
Energy Use	CO_2 emissions	• Primary sources included • HVAC, lighting, & refrigeration	1,560 mw/hw $250,000/mo.	1 Regulatory compliance 3 Toxicity 1 Quantity	2 Human health/exposure risk 2 Source value/cost 3 Treatment/prevention cost	12
Laboratory experimentation	Biological wastes	• Medical school laboratories • Animal science laboratories	<200 lbs/mo $5,000/mo	1 Regulatory compliance 2 Toxicity 4 Quantity	2 Human health/exposure risk 2 Source value/cost 3 Treatment/prevention cost	16

Responsible Person

3.2 Initial Environmental Review

- Introduction ..... page 25
- Planning an Initial Environmental Review 25
- Conducting an Initial Environmental Review 26
- Examination of Existing Environmental Management Practices and Procedures 26
- Identification of Significant Environmental Aspects and their Priority 27
- Identification of Legal and Regulatory Requirements 32
- Environmental Review Report 33
- Implementing the Results of the Review 34

3.2.1 Introduction

On the basis of organizational commitment, an assessment of the current position with respect to the requirements of the EMS standards, of the legal environment in which the organization is operating, and of the significant environmental impacts of activities, products and services should be started. ISO 14001 does NOT require an initial review, but it is good practice to do so, as it will help in formulating an effective environmental policy and in planing the implementation as the next step.

NOTE: Do NOT spend too much time with the initial environmental review because this only delays the implementation of the EMS in the future.

3.2.2 Planning an Initial Environmental Review

In planning the environmental review the following issues should be considered [TANEGA 1994]:

- Authority from the board of directors
- Environmental review team of qualified people
- Methodology and concept for conducting the review
- Approval from operating managers
- Schedule, including dates and time of planned site visits and interviews
- Format of the report and presentation

The resolution of the board of directors should delegate formal authority to the review team to conduct the review as required by the EMS standard. This team will report the results directly to the board of directors.

The team can either be exclusively in-house or include external expertise. The experts needed for this step are primarily from two fields: environmental impact assessment and environmental regulation.

Before receiving approval from operating managers and making the schedule, the team should decide on the methodology (checklist, questionnaire) and develop a practical framework for conducting the review.

The first review will involve a considerable number of interviews and visits. Therefore, in order to keep to the schedule, it is advisable to secure the approval of the operating managers involved well ahead of time. To get the operating managers interested in the review process and in the findings and results, the review team should clearly state the economic rationale for investing in an EMS and conducting this initial review. When making appointments, the review team should emphasize that the persons interviewed should take time out from their normal activities. Only by dedicating their time will the persons interviewed learn from this review.

3.2.2.1 Conducting an Initial Environmental Review

An initial environmental review covers all the aspects of an EMS. As a result of this review the organization knows its strengths and weaknesses, risks and opportunities regarding the current status of its EMS. The gap between the requirements of the EMS standard and the actual status of the organization shows which aspects the organization should focus its efforts on to improve the system. This leads directly to the development of an environmental management program that should fill the gaps.

The review should focus on three key areas:

- Examination of existing environmental management practices and procedures
- Identification of significant environmental impacts and their priority
- Identification of legal and regulatory requirements

3.2.2.1.1 Examination of Existing Environmental Management Practices and Procedures

The methodology for assessing existing environmental management practices and procedures is proposed here using a questionnaire (the questionaire is provided in the appendix on page 71). The review team fills out this questionnaire by interviewing appropriate people, by analyzing existing documents and procedures dealing with environmental issues and by collecting information about environmental aspects of the organization's operations, products and services.

By conducting the initial environmental review, an organization-specific profile of strengths and weaknesses can be drawn up (see Figure 3). Because the score in each EMS area shows the effort needed in terms of financial and human resources,

the organization knows where to focus its efforts when building up an EMS and where the largest effort is needed.

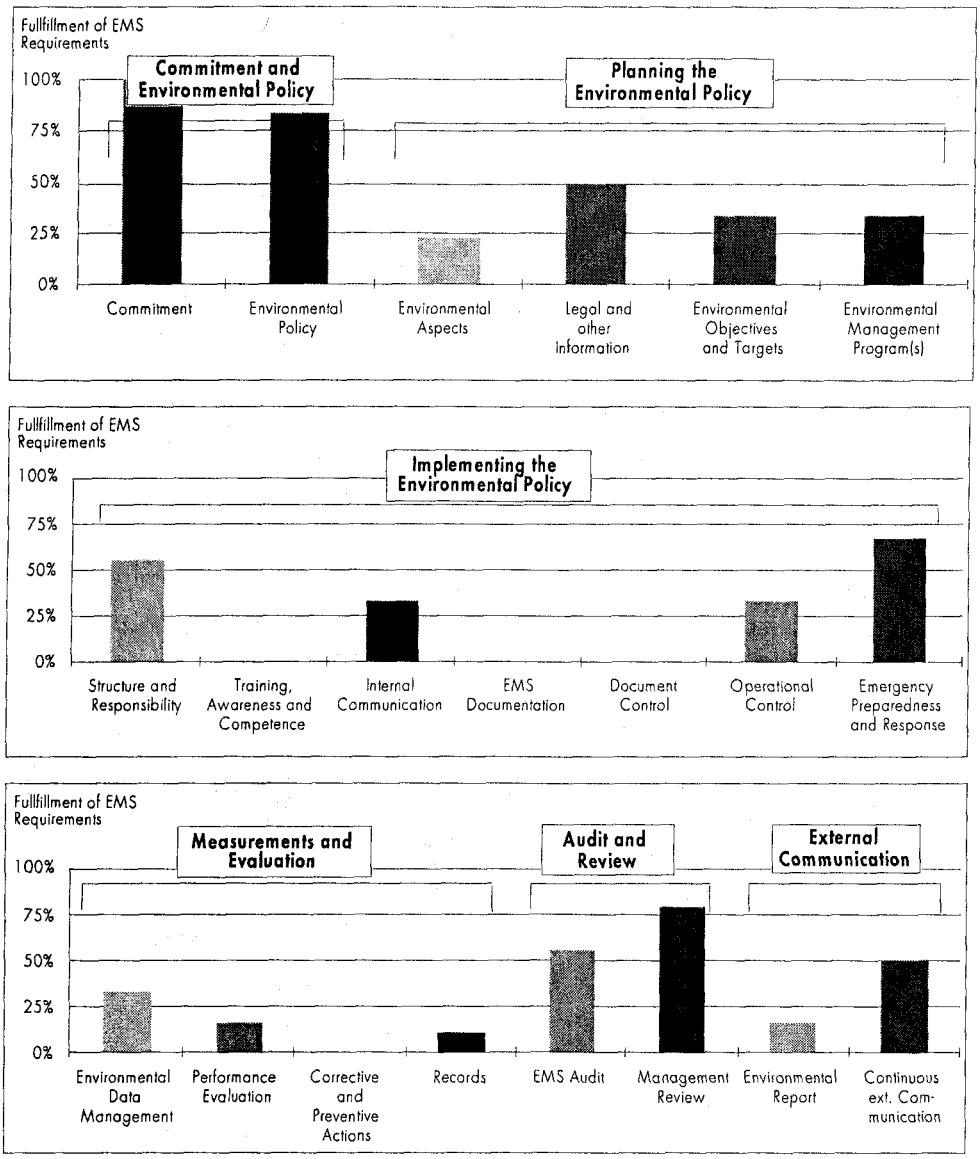


Figure 3: Results of an Initial Environmental Review

3.2.2.1.2 Identification of Significant Environmental Aspects and their Priority

An environmental policy requires top management to set priorities regarding environmental aspects. An initial review clearly shows where to set priorities regarding the EMS itself. But, it does not help to set priorities among different environmental

problems. Many top managers feel pressure to do something for the environment and thus embark on some form of „environmental activism", often containing many isolated activities, but no clear direction. One way to solve this problem is to develop a so called „environmental exposure portfolio" [STURM/SCHALTEGGER 1996].

The first step of this portfolio analysis is to assess the exposure and therefore the importance of different environmental aspects for an organization's overall performance. The appropriate perspective and priorities of the environmental policy will differ depending on this preliminary analysis. The analysis should be conducted from the perspective of the stakeholders of the organization, their needs and their importance for the success of the organization. The degree of exposure to different environmental aspects should guide the involvement and perspective of an organization when implementing an EMS. Evaluating exposure to environmental aspects is important, because this exposure is likely to influence the organization's success sooner or later, either through new legislation, public or consumer perception and behavior or otherwise.

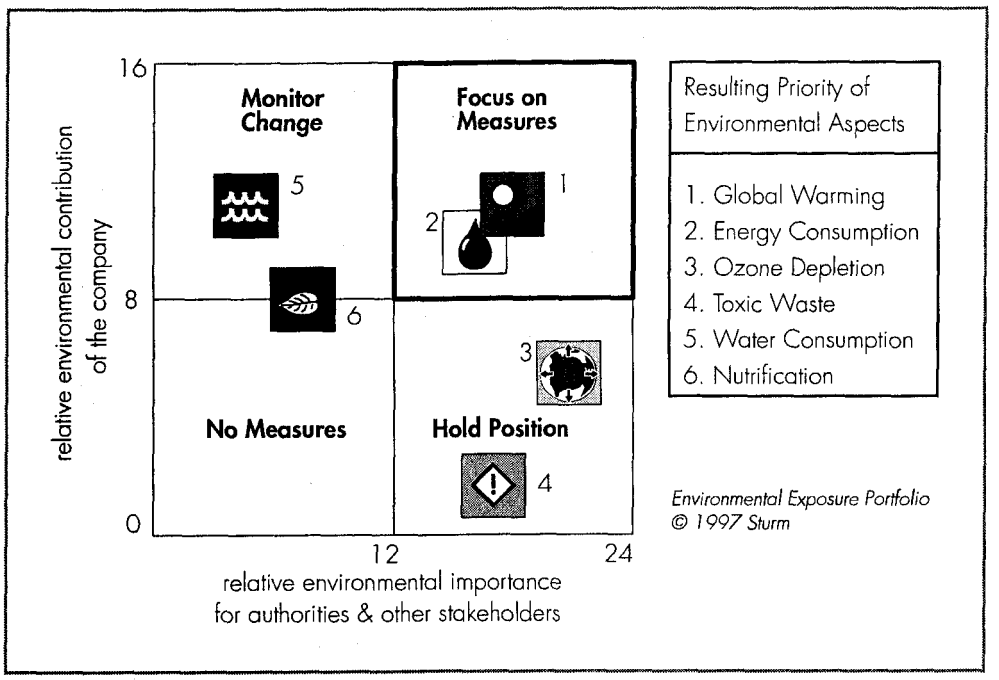


Figure 4: Environmental Exposure Portfolio

The figure above shows an exposure portfolio that focuses on environmental problems and impacts (the country is Switzerland). The same concept could be easily adapted

to evaluate exposure to environmental risks. The environmental contribution of an organization for different environmental problems (e.g. the greenhouse effect, depletion of the ozone layer, etc.) is depicted on the vertical axis. The importance given to these environmental issues by different stakeholders and public environmental policy is measured on the horizontal axis.

NOTE: The selection of environmental problems depends on the socio-political and economic environment. Not every country faces the same problems or perceives them in the same manner. Therefore, the analysis is valid only for the environment it has been conducted in. In other words, a multinational organization needs to perform more than one environmental exposure analysis for each country and/or site in which it operates.

Importance of Environmental Problems	**Environmental Problem Area**					
	Resource Depletion		**Environmental Impact**			
Topic	*Energy*	*Water*	*Global Warming*	*Ozone Depletion*	*Nutrifi-cation*	*Toxic Waste*
Importance given by scientific evaluation	3	2	3	3	2	0
• *social awareness today*	2	1	3	4	0	2
• *social awareness in the near future*	3	2	4	4	1	2
• *governmental policy awareness today*	2	1	2	4	2	3
• *governmental policy awareness in the near future*	3	2	3	2	1	3
• *regulation density today*	1	2	1	4	1	4
• *regulation density in the near future*	2	1	3	1	1	4
Total	**16**	**11**	**19**	**22**	**8**	**18**
Ranking by Importance	***4***	***5***	***2***	***1***	***6***	***3***

Score	*(4 = high; 3 = middle; 2 = low; 1 = very low; 0 = none)*

Table 4: Importance of Environmental Problems

The method for measuring environmental exposure is based on data from a questionnaire given in the Table 4 and Table 5. The greater the organization's contribution to an environmental problem (high score in Table 5) and the higher the importance of the environmental problem (high score in Table 4), the higher the exposure and therefore the priority of the problem from the organization's point of view.

Importance of Environmental Problems	**Environmental Problem Area**					
	Resource Depletion		**Environmental Impact**			
Topic	*Energy*	*Water*	*Global Warming*	*Ozone Depletion*	*Nutrifi-cation*	*Toxic Waste*
• *in-house production processes*	3	2	3	3	3	1
• *upstream production processes*	3	3	4	1	4	1
• *consumption of products*	2	1	1	4	1	0
• *downstream processes*	1	1	3	0	1	0
Total	**9**	**7**	**10**	**5**	**9**	**2**
Ranking by Importance	***3***	***4***	***1***	***2***	***5***	***6***

Score	*(4 = high; 3 = middle; 2 = low; 1 = very low; 0 = none)*

Table 5: Contribution of the Organization

This step is mainly a task for top management. Lower down the organization, line and staff managers can be involved in the formulation of targets and strategies to meet these targets. This can be done by contributing to working groups, which investigate and formulate an opinion on topics of special importance in their respective fields of competence.

The analysis of the expected exposure of an organization to different environmental problems and the weight given to these aspects by various stakeholders enables management to focus on environmental issues that are a high priority to the organization. This is represented in the quadrant in the upper right corner of the environmental exposure portfolio. However, the two quadrants on the left must also be observed, although less vigorously. Issues with low public priority, to which the firm contributes heavily become a problem as soon as the

perception of the stakeholders and the public environmental policy changes (the quadrant in the upper left corner of the portfolio). That this can happen very rapidly is obvious, for example from Shell's „Brent Spar" dumping case (detailed information about this case is available from Shell or Greenpeace at their respective WWW-sites). Investments in new production technology, products and services can increase the environmental impact of the organization when not anticipated early enough. In this case, a problem ranked in the lower right corner of the portfolio would shift to the field with the highest priority. Problems ranked in the lower left corner are of no priority. No measures should be taken here. An overview is given in Table 6.

Focusing Environmental Activities/Programs *Environmental Problem*	**Priority**			
	1 *Focus on Measures*	2 *Hold Position*	3 *Monitor Change*	4 *No Measures*
1. Global Warming	•			
2. Energy Consumption	•			
3. Ozone Depletion		•		
4. Toxic Waste		•		
5. Water Consumption			•	
6. Nutrification				•

Table 6: Focusing Environmental Activities/Programs

Based on this example of an environmental exposure analysis, top management should develop an environmental policy and set priorities derived from the environmental exposure analysis. High priorities then lead to environmental objectives.

3.2.2.1.3 Identification of Legal and Regulatory Requirements

The identification of legal and regulatory requirements assesses two levels of an organization:

- production-related environmental regulations
- product- and service-related environmental regulations

The former addresses the production department while the latter addresses the marketing and R&D departments. Basically, three questions must be answered:

- Which are the relevant environmental regulations? (= target)
- Is the current situation in the organization known? (= actual)
- Does the organization comply with relevant regulations? (=gap)

The methodology used here is a questionnaire. To obtain information about environmental regulations the following information sources can be used:

- governmental authorities
- industry associations
- daily newspaper
- university publications (law departments)

The table below can be used to conduct the review. It is important to collect not only information about current regulations but also to look ahead. With a pro-active approach, activities, products and services can be planed and adapted earlier, with the added benefit of having more time to develop and assess alternative ways to ensure compliance with future environmental regulations. This should lead to lower costs and/or higher economic benefits.

Review of Environmental Regulations			**Compliance Status within the Organization**	**Applicable to**	**Responsibility**
Regulation	*Dated*	*Expected*	• *non-compliance* • *expected to comply* • *100% compliance*	• *Production* • *Product(s)*	*Name and Function*
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...

Table 7: Review of Environmental Regulations

As a result of the review the organization knows its current status both regarding its legal compliance, and opportunities and threats arising from changes in its legal environment.

3.2.2.2 Environmental Review Report

Once the review has been conducted all the information should be presented in a report. The following format can be adopted [TANEGA 1994]:

- **Title Page**
  If the information is confidential, it should be specifically addressed to the person who requested it (e.g. board member or senior manager) and marked „confidential". State the title clearly; naming the organization (organizational unit) and activity. State the name of the author, his or her position, organization, address, telephone, fax and email. Include the date of submission, the name of the addressee of the report and the copyright.

- **Executive Summary**
  As the name suggests, this is a brief summary of the review results. Describe the background and context of the environmental review here and state upon whose request it was carried out. Also draw attention to the most outstanding findings and recommendations, calling for immediate action.

- **Scope of Review**
  In this section, give details of the issues investigated (environmental management system, environmental impacts and environmental regulations). For example, a general questionnaire may have been used initially, with further investigations limited to a specific area. Explain this here and justify your decisions.

- **Findings of Facts**
  Summarize the responses to the questionnaire, the reviewer's impressions of conversations with personnel, observations of the premises and examination of the documents here.

- **Recommendations**
  Prioritize recommendations according to the need for immediate corrective actions and longer term goals. The report should make cost estimations for the recommended courses of action. However, since the cost estimations are not part of the formal requirements of an environmental review, they need not be included.

- **Conclusions**
  Sum up the findings and recommendations into a positive statement of action.

- **Appendices**
  Include the sample questionnaire, summaries of interviews and other important documents.

3.2.3 Implementing the Results of the Review

Based on the results of the initial environmental review, a project can be developed to build up an EMS or to adapt the current EMS to comply with one of the EMS standards. In addition, the methodology for assessing existing environmental management practices and procedures (see the questionnaire provided in the appendix on page 71) and the table for legal assessment (Table 7 on page 32) can be used for the periodic EMS audit required by ISO 14001, BS 7750 and EMAS. The exposure portfolio (Figure 4 on page 28) can also be used to include environmental issues in discussions of business or R&D strategy.

3.3 Planning the Environmental Policy

- Introduction ..... page 34
- Environmental Aspects 35
- Legal and other Requirements 35
- Objectives and Targets 35
- Environmental Management Program(s) 38

3.3.1 Introduction

An organization should formulate a plan to fulfill its environmental policy. The environmental management system elements related to planning include [ISO 14004]:

- identification of environmental aspects and
- evaluation of associated environmental impacts,
- legal requirements,
- environmental policy,
- internal performance criteria,
- environmental objectives and targets and
- environmental management program(s).

The initial environmental review is the source of much of the data needed for the planning process. Therefore, it is advisable to conduct a review. The review will help to identify priority environmental aspects and provide information on how far the organization complies with legal and other requirements. This in turn helps in the formulation of objectives and targets, which are then used to develop an environmental management program. The latter is basically a systematic, detailed means of achieving organizational objectives and targets. If the organization does not have an EMS, the first management „program" should be the implementation of an EMS.

3.3.2 Environmental Aspects

The identification of significant environmental impacts is done by developing an environmental exposure portfolio (see Figure 4 on page 28) for an organization, its activities, products and services. This evaluation of the importance of certain environmental problems to an organization and the analysis of the cause for these problems, as shown later in this chapter, leads to a set of environmental aspects that are significant for an organization.

3.3.3 Legal and other Requirements

The identification of legal and regulatory requirements assesses two levels of an organization:

- production-related environmental regulations
- product- and service-related environmental regulations

The former addresses the production department while the latter addresses the marketing and R&D departments. To obtain information about environmental regulations the following information sources can be used:

- governmental authorities
- industry associations
- daily newspapers
- university publications (law departments)

Assessment of the compliance status of an organization can be done with the methodology used in the initial environmental review (see Table 7 on page 32).

3.3.4 Objectives and Targets

The environmental policy states a commitment to continuous improvement. To control this process, management needs a system of objectives and targets. To be

effective, the objectives should be specific and the targets measurable [ISO 14001].

Setting objectives requires an analysis of the exposure of an organization to different environmental aspects. If an initial environmental review was conducted this step is very straightforward. The identification of significant environmental aspects is done by developing an environmental exposure portfolio, which produces a set of priorities. Environmental objectives should be set for the following environmental aspects as derived from the exposure analysis:

- Environmental aspects which have high public priority and to which the organization contributes heavily.
  Here environmental objectives should be set. They should be given the highest priority, because these environmental problems are very likely to have an impact on the organization's free cash flow.

- Environmental aspects which have low public priority and to which the organization contributes heavily.
  These environmental aspects will have an impact on an organization if public priority changes (e.g. due to new scientific knowledge, accidents etc.). Therefore, the objective should be to keep an eye on possible changes in public perception and hence, priorities, and to prepare alternatives.

- Environmental aspects which have high public priority and to which the organization has a low contribution.
  These objectives should be added to the above if any investments or change in technology (products and production processes) are planed. Because of the high public priority the objective should be to hold the current position by not contributing more to these problems.

Later on, these objectives are used for evaluating environmental performance (because performance can only be evaluated by comparing the current state to a target level or objective).

After the environmental objectives are approved by the CEO, top management should set targets that include a time frame within which they must be achieved. To set targets management must put the environmental objectives in concrete terms. This can be done by evaluating the causes of a specific resource depletion or environmental impact problem. The figure below contains a framework for managing this step. Typically, this step requires the involvement of staff and line managers.

To complete this step, a system of environmental targets has to be approved by top management. An example is given in Figure 5.

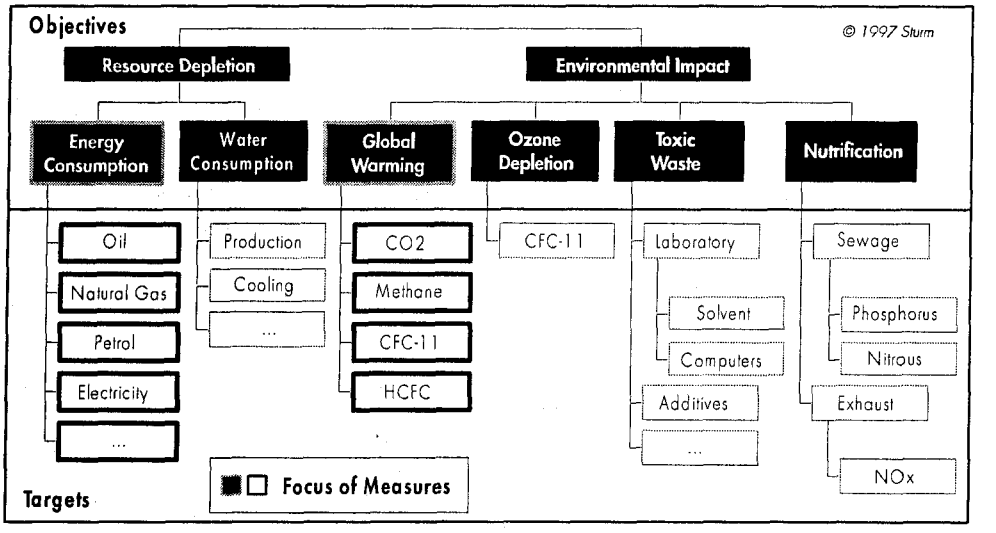


Figure 5: System of Environmental Targets Derived from Environmental Objectives

It is of great importance that the targets are set on an environmental problem level rather than on a causal level. This is illustrated in the following example: Assume that a company wants to reduce its global warming impact by 10% over the next five years. Traditionally, a 10% reduction in fossil fuel consumption would be set as a target. This restricts the organization's options. However, if an approach based on the problem (impact) rather than the cause is followed (Table 8), a company has at least four more options to achieve the target of reducing its impact on global warming:

1. reducing CFC-Emissions
2. changing the mix of energy consumed (for example, substituting natural gas for oil)
3. installing a catalytic end-of-the-pipe methane reduction facility
4. banning the use of HCFCs

All of these measures lead to a decrease in global warming. The question now is which alternative has the least cost or the best return, while achieving the target. In other words, which alternative has the best efficiency, assuming the effectiveness is comparable (10% reduction in the contribution to global warming). To answer this question, management needs a system that enables them to assess the environmental performance of their decisions.

Affected Environmental Objective	Cause = Target (possible examples)	
	Input	*Output*
1. Global Warming	oil, natural gas, CFCs, R-134a	CO_2, methane, ... CFCs, R-134a
2. Energy Consumption	oil, natural gas, electricity, steam, transport	CO_2, methane, NO_x, CO, particulate matter
3. Ozone Depletion	airconditioning	CFCs
4. Toxic Waste	additives, solvents	waste, volatile organic compounds
5. Water Consumption	cooling	hot waste water
6. Nutrification	detergents	*phosphorus, nitrate*

Table 8: From Objectives to Targets

If objectives were anticipated correctly, the expenditure needed to achieve these targets may be a wise investment particularly once competitors are forced by cost drivers (for example, rising energy or waste treatment costs) and/or legislation to improve environmental performance. The sooner a company starts to evaluate alternatives to end-of-the-pipe solutions - for example, by modifying the product and packaging - the higher the return on investment will be. As soon as the competition is forced to improve environmental performance because of costs or consumer pressure and/or environmental law, the initial cost incurred will become a benefit and a competitive advantage.

Besides giving environmental policy a clear focus, this system of targets serves as an input and structure to the environmental effects register.

3.3.5 Environmental Management Program(s)

An environmental management program is a description of the means of achieving environmental objectives and targets [BS 7750]: It details what must be done, by whom, how and when for each of the defined objective and targets of high priority. This entails [TIBOR/FELDMAN 1996]:

- Designating responsibility for achieving objectives and targets at each relevant function and level.
- Providing the means (i.e. people, skills, technology, financial resources etc.) for fulfilling the objectives and targets.
- Designating a time frame within which objectives and targets will be achieved.

Aspect & Impact Rating Worksheet

Rev. I, GE, 4/7/99
Assumptions: Under **direct** control of RA
Type of Impact: Controllable

Process/Activity: _____ Dept: _____

Date of Meeting: _____

Additional Process/Activity Notes:

Evaluators	Dept/Expertise

Normal Conditions: Routine, planned operating conditions
Abnormal Conditions: Unplanned, but reasonably foreseeable events
*** if no controls (preventive maint., 2ary contain, etc)*

		Normal Conditions		**Abnormal Conditions ****	
Vector:	Aspect(s):	Rating	Comments/Controls	Rating	Comments
Air Emissions					
Water Discharges					
Hazardous & Potentially Haz. Waste					
General Trash					
Human Aesthetics					

Environmental Aspect Scoring Guide

Date:

Scorer(s):

Instructions:

For each product, service or activity (or group of products, services or activities), each element in the table will be assigned scores for:

1. Health
2. Flammability
3. Reactivity

Scores range from 0 to 4, with 4 being most severe (deadly).

Each product will also be evaluated for regulatory relevance.

Degree of Impact:

4 = Serious (likely to result in severe of widespread damage to human health or the environment

3 = Moderate

2 = Minor

1 = No Impact (unlikely to have an adverse impact on human health or the environment)

Chemical and/or Process	Health (0 to 4)	Flammability (0 to 4)	Reactivity (0 to 4)	313 List Y or N	HAP List Y or N	Regulated By	Degree of Impact (1 to 4)	Significant Aspect

Final Instructions

1. A score of 3 or higher for degree of impact may be a determing factor
2. All aspects, whether significant or not, need to be indicated on the Significant Aspects - Impacts List, 04-CSE4-002.
3. Those aspects deemed significant need to be communicated to the appropriate section for opeational control development.

City of Gastonia
Environmental Management System
Aspects and Impacts Analysis Procedure

Step 1. During the months of November and December of each year, the WWTD will analyze each of the following areas to determine aspects and impacts.

- Long Creek Wastewater Treatment Plant Operations
- Crowders Creek Wastewater Treatment Plant Operations
- Long Creek Laboratory
- Crowders Creek Laboratory
- Residuals Management
- Maintenance within the above areas

Step 2. Document analysis of each aspect on Form # EMS-A&I-1. The form must be completed in its entirety.

Step 3. Each EMS-A&I-1 form that has an "X" in the high category for either severity or frequency will be analyzed further to determine if the aspect is significant or not.

Step 4. Further analysis will be done using Form # EMS-A&I-2 and the best professional judgement of the supervisor of the respective area. Again this form will be completed in its entirety. The following items should be taken into consideration when completing this form: practical control, true risk, probability, and environmental impact data.

Step 5. Once EMS-A&I-2 has been completed, all aspects determined to be significant will then be listed on Form # EMS-A&I-3.

Step 6. Each of the above forms will be signed by the individual who developed the individual form and approved by the Assistant Superintendent of the Wastewater Treatment Division.

Step 7. Once the policy and aspects have been reviewed and significance determined, objectives and targets will be developed for the following year and will consider the following information:

- ☐ Legal and other requirements
- ☐ Siginificant environmental aspects and impacts
- ☐ Prevention of pollution
- ☐ Technological options
- ☐ Financial, operational, and business requirements
- ☐ Gastonia WWTD environmental policy
- ☐ Views of interested parties

ENVIRONMENTAL : ASPECTS AND IMPACTS

Process or Activity:_____

Originator Signature:	Date
Supervisor Signature/Approval:	Date

Potential Impacts	High		Moderate		Low		None or N/A		Unknown	
	S	F	S	F	S	F	S	F	S	F
Emissions										
Air										
Surface Water										
Soil										
Groundwater										
Hazardous Waste										
Accidental Release										
Landfill										
Resources										
Water										
Energy										
Electricity										
Natural Gas										
Fuel Oil										
Societal Effects										
Regulated										
Federal										
State										
Local										
Appearance										
Noise										
Odor										
Cost (penalties, etc...)										
Employee Exposure										
Public Relations										
Other (Specify)										

S=Severity
F=Frequency
Form #: EMS-A&I-1
Effective Date: 2/10/99
Revision # 0

Form Approval:
Approver:
Verifier:

ENVIRONMENTAL : ASPECTS AND IMPACTS

Process or Activity:_____

Originator Signature:	Date
Supervisor Signature/Approval:	Date

High Impacts	Rational for Why or Why Not Listed as Significant	Significant? (Yes or No)

CPW ENVIRONMENTAL MANAGEMENT SYSTEM PROCEDURE

The on-line version and secured hardcopy are the controlled documents. The secured hardcopy will be identified by an "Official Document" stamp giving date of distribution. Any and all other documents are uncontrolled. Contact the EMS Program Manager for revision level status.

Effective Date:	**October 1, 2000**	**Page 1 of 4**
Revision: 2	**Identification Number: EMS – 4.3.1**	
Title:	**Environmental Aspects and Significant Impacts Procedure**	
Prepared By:	**EMS Procedures Subcommittee**	
Reviewed By:	**EMS Management Steering Committee**	
Approved By:	**William E. Koopman, Jr., General Manager John Cook PE, Assistant General Manager**	
Date Approved:	**August 25, 2000**	

0.0 Requirement **ISO 14001, Sub Clause 4.3.1 Environmental Aspects**

1.0 Purpose

This procedure describes the process that is to be used in identifying environmental aspects of the facility's activities, products and services over which it can control or influence. The procedure also describes the process for determining if identified aspects should be categorized as significant and how significant aspects should be ranked in terms of setting objectives, targets and controls.

2.0 Scope

ISO 14001, sub clause 4.3.1 requires a documented process to identify the environmental aspects of its activities, products or services that it can control in order to determine those which can or may have significant environmental impacts.

3.0 Responsibility & Authority

The department head shall ensure that the identified aspects with significant environmental impacts are considered in setting of the department's environmental

objectives and targets and that established Environmental Improvement Plans are implemented, tracked and communicated to the department associates.

4.0 Procedure

4.1 Identifying Environmental Aspects

4.1.1 A systematic method shall be used in identifying and analyzing environmental aspects related to CPW activities, products and services. Identification procedures can include review of regulatory requirements, checklists, record review, bench marking, cost/benefit analysis, startup and shutdown operations, direct inspections, interviews with key associates, review of supplier activities, and analysis of potential emergency situations.

4.1.2 Environmental aspects shall be identified for all key EMS departmental activities having the potential for harmful interactions with the environment and public health. Areas to be considered include:

a) air emissions
b) discharges to surface waters or groundwater
c) hazardous wastes handling, disposal and transport
d) solid wastes handling and disposal, including transport
e) noise/other nuisances
f) contaminants
g) use of energy
h) use of water for public consumption/water quality
i) odors
j) emergency response
k) relevant issues of interested parties
l) chemical or product storage
m) regulatory requirements
n) industrial waste pretreatment program

4.1.3 A documented record of aspects shall be maintained and reviewed annually. New aspects, as conditions warrant, shall be considered as necessary.

4.2 Ranking Aspects

Once environmental aspects have been identified, they shall be reviewed by the department head to determine their significance related to potential for environmental impacts. In evaluating the significance of an impact, past, present and potential for future events should be considered.

4.2.1 The following criteria can be used: assessment of regulatory requirements, existing environmental management practices and procedures, existing policies, new technologies, best management practices (BMP's), contracting activities, lessons learned from previous incidents, views and opinions from interested parties, results of recent research, availability of resources, cost benefit analysis, and assessment of hazards and risks and liabilities. Additionally, ecological features of specific locations can be considered, current use of energy, and aesthetics' such as visual impacts, noise, odors or other non quantifiable impacts.

4.2.2 Significant aspects shall be approved by the department head and reviewed by the EMS program manager before categorization becomes official and control/management activities ensue.

4.2.3 Aspects considered to be significant shall be prioritized in a documented record. The record shall be reviewed as needed to set associated environmental objectives and targets and measures of control. Resources, including labor and financial, shall be considered when establishing objectives and targets.

4.2.4 CPW department heads shall review the significant environmental aspects with associated significant environmental impacts on an annual basis and prepare a progress report on how these activities/products/services are managed and tracked. This report shall be furnished to the EMS program manager, section head and executive management for review.

4.2.5 Department heads shall communicate the significant environmental aspects and associated environmental impacts to

associates within the department and where necessary, contractors working on site.

4.3 Related Documents and Data

Document Control Procedure

4.4 Records

4.4.1 Environmental Aspects List
4.4.2 Annual Aspects Review
4.4.3 Relevant associate training records

4.3.1 Environmental Aspects

The following definitions are provided in the ISO 14000 standards:

Environmental Aspects - Element of an organization's activities, products, or services which can interact with the environment.

Environmental Impact - Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services.

Significant Environmental Aspect - An environmental aspect which has or can have a significant environmental impact.

Mt. Holly shall identify the significant environmental aspects of the existing plant production processes and activities which can impact the environment in order to establish best management practices and set environmental objectives. A plant procedure shall be established and maintained for identification of environmental aspects and determination of"significance" based on potential impact to the environment. This "Environmental Assessment" procedure (MH-EV-S-003) shall be used to evaluate potential environmental impact from plant activities. Plant activities shall include production processes, maintenance & purchasing functions, proposed process modifications, construction, contracted services or other projects with potential environmental impact.

Environmental assessments shall be conducted within each departmental area of the plant. The significant environmental aspects shall be documented in each department with cross references provided for the control measure or reference procedure designed for pollution prevention or to minimize potential impact on the environment. The environmental aspects identified in each department, which have or can have a significant impact on the environment, shall be considered in setting environmental objectives. The Significant Environmental Aspects Form (MH-EV-F-005) shall be used by each department for the identification of aspects specific to their areas of responsibility. Any additional aspects that may arise after an initial assessment shall be added to the form. The completed form shall be retained by the department indefinitely.

All information concerning environmental aspects shall be kept up-to-date.

4.3.2 Legal and Other Requirements

Alumax of South Carolina is required to comply with a variety of legal and other requirements that are applicable to the environmental aspects of its activities, products, or services. The following information shall provide a description of the various requirements placed on the Mt. Holly facility. ***The Environmental Department shall have responsibility for ensuring compliance to all legal requirements.***

Alumax of SC operates within the jurisdiction of the South Carolina Department of Health and Environmental Control (DHEC). This agency was established by the South Carolina Pollution Control Act which details the powers of DHEC. The state is in the jurisdiction of Region IV of the Environmental Protection Agency (EPA). DHEC and EPA utilize several regulatory techniques to provide a mechanism for compliance with environmental law. This includes permitting, licensing, registration, certification, monitoring, and reporting. All permits, licenses, registrations, certifications, and other records of compliance shall be maintained by the Environmental Department. The following list shall describe the mechanisms employed along with applicable plant requirements:

4.3.2 Legal and Other Requirements (cont'd)

Permits

Alumax of SC maintains permits listed below:

- Air Operating Permit
- PSD Construction Permits (Large Anode Project Issued 1995)
- NPDES Permit
- General Stormwater Permit

Licenses

The following licenses are required for Mt. Holly's operation:

- Biological Wastewater Treatment Operator Licensees - "B" level (operators of the Sewage Treatment Plant)
- Asbestos Abatement License (for removal of asbestos insulation during pot changes)

Registration

Alumax of SC is required to provide notification and a description of our facility at the time a new regulation becomes effective. Alumax has registered the following notifications:

- (Large Quantity) Generator of Hazardous Waste
- Ownership of Underground Storage Tanks (UST)
- Usage of a SARA listed "Extremely Hazardous Substance"
- Department Of Transportation (DOT) notification of hazardous materials traffic

Certification

Alumax of SC is subject to the following certifications:

- SPCC Plan (PE certification)
- SWPP Plan (PE certification)
- Construction Engineering Reports (PE certification)
- "Generator's Certification" that Alumax has a Program to reduce toxicity of chemicals used & waste generated (signed by person who signs Hazardous Waste Manifests)
- Annual Title V Air Compliance Certification (Plant Manager's certification)
- EPCRA Form R (Toxic Release Inventory) Reports Certification (Plant Manager's certification)

Monitoring

Alumax is subject to various monitoring requirements. Required monitoring for Alumax of South Carolina is shown below:

- Potline Roof Total-F emissions (Federal NSPS)
- Primary Alumina Dry Scrubber Stack Total-F emissions (Federal NSPS)
- Hood Inspections (Roof Monitoring Variance condition)
- Sulfur content of the raw materials, Petroleum Coke and Liquid Pitch (PSD Permit conditions)
- Sewage Treatment Plant discharge for Cl2, BOD5, TSS, Fecal Coliform, DO, N+, and Flow (NPDES Permit)
- Daily operating & maintenance inspections of Sewage Treatment Plant using Best Management Practices

Monitoring (cont'd)

- Stormwater Outfalls for Oil & Grease, BOD5, COD, TSS, pH, Total Cd, Total Cu, Total As, Total Cr, TKN, Total P, Cl2 (313 water priority pollutant), and in lieu of WET, Al, F, and PAH (Stormwater Permit)
- Chemical accounting including inventory of hazardous chemicals and amount used, processed, released and transferred off-site of EPCRA 313 listed toxic chemicals. (Federal EPCRA)

Reporting

The following table shall list all required reports for compliance with operating permits or state and federal regulations.

REGULATORY COMPLIANCE REPORTS LIST			
ROUTINE EXTERNAL REPORTS			
REPORT NAME	**REQUIRED BY**	**FREQUENCY**	**DEADLINE**
Emission, Potline	Air Permit - DHEC	3/Year/Line (6 Total)	None Specified (Target = 45 days after test)
Emissions, Scrubbers	Air Permit - DHEC	Annual	None Specified (Target = months after last test)
Emissions Inventory	Air Permit - DHEC	Annual	None Specified (Target = Mar 31 of following year)
Discharge Monitoring	NPDES Permit - DHEC	Monthly	30 days after month end
Water Use Report	Water Commission	Quarterly	30 days after quarter end
Hazardous Waste Manifest	(DHEC) TSDF	Every Shipment	Prepare prior to shipment & procure TSDF signed copy within 45 days. File for 3 years minimum.
Hazardous Waste Report	DHEC	Quarterly	30 days after quarter end.
Asbestos Abatement	DHEC	Quarterly	30 days after quarter end.
Hazardous Waste Minimization	DHEC	Annual	January 31
Tier II	(SARA sec 312), DHEC, Fire Dept, LEPC	Annual	March 31
Hazardous Chemical List	(SARA sec 311), DHEC, Fire Dept, LEPC	When Inventory (TPQ) changes for reporting year	60 days after 311 list changes
R-Form	(SARA sec 313), EPA, DHEC	Annual	July 1
Environmental Compliance	Alumax, Inc.	Quarterly	Mar 31, Jun 30, Oct 31, Dec 31
Air Permit Renewal	DHEC	Every five years	May 31, 1995
Water Permit Renewal	DHEC	Every five years	180 days prior to expiration on Mar 31, 1992
NONROUTINE EXTERNAL (EXCEPTION) REPORTS			
Hazardous Chemical Release	(CERCLA/SARA), EPA - NRC, DHEC - SPC, Local - LEPC	Release of "RQ" of haz chemical within 24 hour period	Phone notification (immediate) within 24 hrs of RQ release followed by written follow-up report within 15 days.
Exception Report	DHEC, EPA	Failure to procure signed TSDF copy of manifest within 45 days of shipment	35 days for Transportation/TSDF notification 45 days for DHEC notification
Air Pollution Control By-pass Notification	DHEC (District)	≥ 1 hour duration	1. Phone prior to for planned work Equipment malfunction & within 24 hours of beginning for unplanned. 2. Written report within 30 days.
NPDES Exceedence Notification	DHEC	Every exceedance	Oral - 24 hours Written Report - 5 days
Accumulation Time Extension	(EPA), DHEC	Haz wastes which will be stored ≥ 90 days	Before 90 day deadline request 30 day extension.
INTERNAL COMPLIANCE REPORTS			
Waste Storage Inspection	EV-WM-S-222	Weekly	Daily
Spill Reports	CERCLA, SARA sec 304, CWA Sec 311	Every spill in quantity of 12 gallons or more	3 days

Environmental Program Requirements

The Environmental Department shall be responsible for the development of environmental programs which shall specify regulations and requirements of permit conditions, compliance reports and procedures or policies designed for compliance with all requirements. A program manual shall be established for each environmental program. Requirements shall be developed in accordance to Corporate policies and guidelines which are maintained in the Alumax Environmental Management Guidelines Manual.

Regulatory Information Resources

The Environmental Department shall identify environmental requirements for the plant using the various resources listed in the following.

Reference Documents: The Environmental Library is maintained with:

- Aboveground Storage Tank regs (Thompson Update)
- Alumax Environmental Guidelines Manual
- Community Right to Know (Thompson Update)
- CFR Books (Code of Federal Regulations)
- DHEC - SC Air Pollution Control Regulations & Standards
- DHEC - Hazardous Waste Management Regulations & Standards
- Environmental Compliance, A Simplified National Guide (STP Update)
- Federal Register (Subscription)
- Federal training Guide (STP Update)
- International Environmental Systems [CEEM Update]
- Ozone Depleter Compliance Guide (Thompson Update)
- SC Environmental Compliance Update
- State Register Books
- Underground Storage Tank regs (Thompson Update)

Enflex Software: application which is designed for fast regulatory searches.

Regulatory Training: Conferences and workshops shall be attended by plant personnel with key Environmental responsibility on a regular basis to maintain up-to-date knowledge of current and upcoming regulatory requirements.

Aluminum Association: Provides information on regulations and anticipated compliance requirements.

Alumax Inc Environmental Services: Provides updates on new regs with potential impact.

SC Chamber of Commerce: Representation is maintained on the technical committee of the Chamber. Environmental legislation is reviewed monthly and assistance given to develop guidance for SC State in development of sound, practicable environmental regulations.

4.3.3 Objectives and Targets

Environmental objectives and targets shall be established and maintained at each relevant function and level within the plant. When establishing and reviewing objectives, consideration shall be given to strategic plans, legal and other requirements, significant environmental aspects, technological options (including best available control technology), the financial outlook and views of interested parties. Objectives should be consistent with environmental policy and commitment to pollution prevention and should also be specific and measurable with the primary responsible person identified.

Objectives and targets should be reviewed on a periodic basis with actions taken to support the desired improvement in environmental performance. The Mt. Holly organization develops objectives on four primary levels which are described below:

- Strategic Plans - Environmental strategies shall be established as a part of the plant's strategic planning process which is designed to facilitate achievement of business goals.
- Plant Goals - Environmental goals shall be established as part of the development of annual "plant goals". These shall be linked, where appropriate, to plant strategic plans.
- Department Goals - Environmental goals shall be established as part of the development of annual "departmental goals". Each year the significant environmental aspects of each department shall be reviewed and objectives established. The department Manager shall be responsible for ensuring that targets and objectives are established and carried out in accordance with plant policy.
- Team Objectives - Teams chartered within the scope of the plant environmental management system shall have objectives defined in the team charter. Any standing or natural teams chartered with an environmental objective shall be included in Section 4.4.1 (Structure and Responsibility) of this manual.

4.3.4 Environmental Management Programs

The Environmental Department at Mt. Holly shall establish an Environmental Quality Management (EQM) program which shall be used to establish and implement an environmental management system for the plant in accordance with environmental policy and the ISO 14001 standard. The EQM program shall describe the overall environmental management program used by the plant including environmental policy, planning, documentation, checking/ corrective action and management review. The scope of the EQM program shall include provisions for new or modified activities, products or services.

The EQM program shall depend on other management programs to fully manage specific areas of environmental concern. These other environmental management programs shall be designed to define specific management methods which shall be developed following EQM program guidance. The EQM and other environmental management programs shall reference each other for certain information.

The following chart shows program manager responsibility for each management program.

MANAGEMENT PROGRAM	PROGRAM MANAGER
*	*
Air Quality Control	Air Quality Supervisor
Wastewater Management	Water Quality Supervisor
Stormwater Pollution Prevention	Water Quality Supervisor
Cooling Water Treatment	Water Quality Supervisor
Waste Management	Hazardous Materials Supervisor
Emergency Preparedness & Response	Hazardous Materials Supervisor
Spill Prevention, Control & Countermeasures (SPCC)	Hazardous Materials Supervisor
Chemical Management	*Water Quality Supervisor*

ENVIRONMENTAL DEPARTMENT ENVIRONMENTAL ASPECTS

November 1, 1996

	ACTIVITY, PRODUCT OR SERVICE	SIGNIFICANT ENVIRONMENTAL ASPECT	IMPACT	CONTROL METHOD
1	Operation of DCs	Potential Fugitive PM Emissions	Air Pollution	Dust Colletor Operation Plan
2	Operation of Bake Oven Scrubber	Potential Stack 001 Emissions (PM, HF, & Opacity)	Air Pollution	Anode Bake Dry Scrubber Operation Plan
3	%S Content in Anodes Processed	SO_2 emissions dependent on S%	Air Pollution (acid rain contributor)	Chemical Management Plan
4	Operation of Potline Scrubbers	Potential Stack 002-005 Emissions (PM, HF, & Opacity)	Air Pollution	Potline Dry Scrubber Operation Plan
5	Operation of Anode Former Scrubber	Potential Stack 85 Emissions (PM, VOC, POM & Opacity)	Air Pollution	Dust Collector Operation Plan
6	Operation of DPU material transport	Potential Fugitive PM Emissions due to line leaks.	Air Pollution	Maintenance PM Schedule and line inspections
7	Filter Bag Recycling in Pots	Recovery of ore raw matl & prevention of landfill disposal	Landfill Reduction & Conservation of Bauxite Natural Resource	Procedure EV-WM-S-386
8	Filter Bag QC (testing & specs)	Prevent potential emissions from bag defects & early failure.	Reduction of Air Pollution	Filter Bag Quality Assurance Plan
9	Ambient Monitoring of Medway Plantation	Potential for vegetation damage from plant emissions & worry of owner.	AQC Quality Assurance & Community Service.	N/A
1	Blow Down from CWT systems	Potential for high water consumption for make-up	• Wastewater • High usage of potable water	• Wastewater segregated & treated • Treatment plans include max cycles to minimize water/ chemical usage.
2	Casthouse cooling water management	• Oil released to sprayfield • Waste oil spill potential	• Contamination of sprayfield • Contamination of ground water	• Inline oil removal equipment. • Waste mgmt EV-WM-S-001.
3	Quenching billet during casting	Water quality affects surface brightness causing scrap if "dark color" occurs.	Scrap generates extra air emissions from furnace for re-casting.	Avoid use of phosphonate containing chemicals.
1	Anode Cooling (Bath)	Quenching of green anodes in water contaminates water .	Wastewater requiring treatment	• BD reused in evaporative cooling tower to cool Bake Oven gases. • Any wastewater not recycled in tower is segregated & treated
	Chemical Treatment of Cooling Water	• Potential for Air Toxics • Liquid wastes • Chemical handling spills	• Contamination of sprayfield • Contamination of ground water	• Chemical Approval MH-EV-P-001 • Drum Handling MH-EV-S-004 • Chemical Strg/Hndlg (MH-EV-P-36)

ENVIRONMENTAL DEPARTMENT ENVIRONMENTAL ASPECTS - 11/1/96

	ACTIVITY, PRODUCT OR SERVICE	SIGNIFICANT ENVIRONMENTAL ASPECT	IMPACT	CONTROL METHOD
1	Potable Water Leak into Sewer System	Potential loss of Process Control	• Adverse impact to water quality in creek. • Permit violation	Employees report defective faucets/toilets & maint. repairs.
2	Sewage Treatment Plant operation	Potential loss of Process Control.	• Adverse impact to water quality in creek. • Permit violation	• Improved lift station operation. • Improved process control
3	Janitorial Service	Potential STP upset from cleaners & debris disposed of in toilets & bathrm drains.	• Adverse impact to water quality in creek. • Permit violation	• Approval of chemicals used. • Training of Janitorial crew.
4	Plant wide Hazardous Materials handling/ disposal	Potential hazardous substances released to the STP	Kills biological microbes needed resulting in permit exceedance & water pollution	Employee awarenes of potential impacts to STP.
5	Wastewater Treatment Training	• Plant employee (general training) • STP Operators certified training	• Impact Awareness resulting in less upsets from ignorance or lack of communication.	• General awareness training • 12 hrs certified training/ 2 yrs
6	Toxic Chemical or oil leak into Cast House, Anode Cooling or Compressor room cooling water systems.	Contamination of Process Wastewater sent to Spray Field	Contaminated ground/ groundwater and violation of DHEC policy	• Employee awarenes of potential impacts to Spray Field. • Installation of oil removal equipment
7	Land Application of Process wastewater	Spray Field soil not perking	Ponding of water on sprayfield, violation of DHEC policy	• Turn off spray risers in #1 sect. • Control spray (3hr ea w/ 45 min rest)
8	Anode Baking pit maintenance	Cracks in bake oven pit, leaking tar.	Contaminated groundwater	Quarterly monitoring .
9	Spray Field land application	Potential irrigation using contaminated water	Contaminated groundwater	Quarterly monitoring .

	ACTIVITY, PRODUCT OR SERVICE	SIGNIFICANT ENVIRONMENTAL ASPECT	IMPACT	CONTROL METHOD
1	Stormwater management (Stormwater Pollution Prevention)	Failure in SWPP mgmt would result in : • Regulatory noncompliance • Release of pollutants into stormwater runoff .	• NOV from DHEC w/ potential loss of permit for plant op. (&/or fine) • Water pollution	• Plant policy requires maint. of SWPP Plan & reg compliance. • Responsibility assigned • Annual SWP2 Site Assessments
2	Operation of APC DPU pumps	Line leaks release ore to ground with potential for contact with rain.	Stormwater Pond sedimentation requiring dredging & water pollution.	• Maintenance PM of line thickness & prev maint before leak. • Policy to require immediate shut off of DPU upon line leak. • Regular housekeeping to collect ore from paved grounds.
3	Waste Accumulation & Storage	Potential to release contaminants (carried by rain).	Water pollution	• Plant policy requires storage of wastes in secure conatined areas. • Inspection (EV-SC-S-284).
1	WFA Operation	Potential spills during waste handling	Contamination of ground / water	Used Oil Management Plan & EV-WM-S-002
2	Recycling Program	Office Recycling Fluorescent Lamp Recycling Used Tires Spent Acid Batteries Waste Containers	[Waste diverted from landfill]	MH-EV-S-019 MH-EV-S-014 MH-EV-S-016 MH-EV-S-017 MH-EV-S-015
3	Plant Operations & Activities	Solid Waste Generation	• Landfill capacity loss • Potential release to environment	• Waste Minimization Plan • Solid Waste Management Plan
4	Waste Disposal (offsite)	TSDF responsibility	Mt. Holly liability	TSDF Audits
5	Community Service	• Service on Berkeley County Kids Who Care Committee • Service on Recycling Market Dev. Adv. Council • Employee Recycling Center opeartion	• Develop Env. awareness in schoolchildren & community • Increase recycling markets to divert waste from landfill • Waste (generated at employees homes) diverted from landfill	• MH-EV-S-012 (assumed by Waste Mgmt Tech • MH-EV-S-012 (assumed by Env Facilitator) • MH-EV-S-012

	ACTIVITY, PRODUCT OR SERVICE	SIGNIFICANT ENVIRONMENTAL ASPECT	IMPACT	CONTROL METHOD
		WASTE MANAGEMENT (Cont'd)		
6	Maintenance Service of lubrication systems	• Waste drums (potential spills) • Potential oil spills • Lubricant usage	• Contamination of ground/ water & noncompliance • Oil contamination of ground / water • Use of petroleum Natural Resource	• Drum Management Plan • Used Oil Management Plan & SPCC Plan • Oil Purification/Reuse (Maint)
7	Maint parts cleaning using solvent	Potential solvent spills	Air & water pollution	Solvent Management Plan
8	Pot Changeout	• ACM Removal • ACM Disposal	• Health Hazard for Employees • Air Pollution	• Asbestos Abatement Plan • MH-EV-S-008 Storage & EV-WM-S-276 Disp.
9	Pot Demolition	• SPL Removal, Storage & Shipping (potential release) • ACM Removal	• Water contamination from CN & F leachate • Health Hazard for Employees	• SPL Management Plan • Asbestos Abatement Plan
1	Painting	• Potential releases of VOC. • Release of toxics during sandblasting	• Air Pollution • Water Pollution	• Alumax control of Paint specs • Containment of contaminated sand & cleanup specified in contract.
2	Chemical Product Purchase	Potential to procure toxic chemicals which can be released.	Pollution	Chemical Product Approval (MH-EV-P-001)
3	Bulk (Tank) Chemical Storage	Potential realease from tanks	Contamination of water (creek & ground)	Chemical Storage Plan (CMM -3.6.4)
4	Chemical Storage - Dms	Potential realease from drums	Contamination of water (creek & ground)	Chemical Storage Plan (CMM -3.6.4)
5	Anode Production	• Releases: Pitch, Coke , Carbon Dust • >10,000 ppd inventory	• Stormwater runoff contamination • Tier II reports required	• SWPP Plan & SPCC Plan • Tier II reports (EV-SR-S-274)
6	Aluminum Production	• Release of Alumina, Al F & Soda Ash. • >10,000 ppd inventory of above • >25,000 ppy HF processed/ released • Al(fume) processed • >25,000 ppy COS emissions processed • CF_4 & CO_2 emissions	• Pollution of stormwater & air (PM) • Tier II reports required • R-Form report, Air & Veg impact • R-Form report required • R-Form report required • Greenhouse gases (global warming)	SWPP Plan & AQC Manual 3.6.2 -.4 • Tier II reports (EV-SR-S-274) • Form R Reprt (CMM-3.6.2) • Form R Reprt (CMM-3.6.2) • Form R Reprt (CMM-3.6.2) • CMM (3.6.6)
7	Bath , Cryolite (handling)	• Potential release • >10,000 ppd inventory	• Contamination of water • Tier II reports required	• SWPP Plan • Tier II reports (EV-SR-S-274)

	ACTIVITY, PRODUCT OR SERVICE	SIGNIFICANT ENVIRONMENTAL ASPECT	IMPACT	CONTROL METHOD
8	Cleaning using solvent	Potential release	Pollution	• Chemical Product Approval (MH-EV-P-001) • Chemical Storage Plan (CMM-3.6.4)
9	Chlorine Storage	>500 ppd inventory	• Notification of EHS subject to 302 • Tier II reports required	Tier II reports (EV-SR-S-274)
10	Degassing Using Chlorine (Holding Furnaces & Induction Furnace)	• >10,000 ppy used • Cl2 emissions	• R-Form Report • Contamination of air (ozone depleter)	• Form R Reprt (CMM-3.6.2) • CH Cl2 feed rate (@minimum)
11	Dross Dust processing	• >10,000 ppd Dross Dust inventory • >25,000 ppy Al dust processed • emissions	• Tier II report required (Dross Dust) • R-Form Report (Al dust) • Air Pollution (Al dust)	• emissions • Form R Reprt (CMM-3.6.2)
12	Aluminum Casting using alloys	• >10,000 ppd inventory: Cu, Mn & Cr. • >25,000 ppy processed: Al fume, Cu, Mn & Cr • Metal fume emissions	• Tier II Reports required • R-Form Reports required • Air Pollution	• Tier II reports (EV-SR-S-274) • Form R Reprt (CMM-3.6.2) • NA (insignificant), but reported
13	Dry Scrubber Operation (BO & PL)	• >25,000 ppy HF processed • HF emissions (stack)	• R-Form Report • Air Pollution & & potential harm to vegetation.	• Form R Reprt (CMM-3.6.2) • Dry Scrubber Control Plan (AQM -3.6.2-.3)
14	Sewage Treatment Disinfection	• Potential Cl2 release	• Air pollutotion (ozone depleter)	• EV-WC-J-064
15	Cooling Water Treatment	• Potential for release of treatment chemicals	• Contamination of ground & water.. • Noncompliance	Chemical Storage Plan (CMM -3.6.4)

SIGNIFICANT ENVIRONMENTAL ASPECTS

ASSESSOR: _____ AREA/ ACTIVITY: _____ DATE:_____

SCOPE OF ASSESSMENT: _____

1. **Environmental Aspects** - List major raw materials and natural resources used (including fuel). Note any potential significant environmental impacts:

Products/Raw Material/Resource for fuels list type, estimated quantity (BTU/hr, KWH, etc.)	Potential Significant Air Impact? Yes or No?	Potential Significant Water Impact? Yes or No?	Potential Significant Solid Waste Impact? Y/N?	Potential for contamination to land? Yes or No?	Any SARA Chemical used? Yes or No?

2.(a.) **Emissions to Air:** From table 1 above, list all significant air emissions sources from this process and potential significants if not properly controlled.

Description	Point Source ID	Source Type	Pollutant >5 TPY criteria or 1000 lbs.HAPS	P2 Control Used including practices and procedures	Monitoring and Measurement Techniques

SIGNIFICANT ENVIRONMENTAL ASPECTS

ASSESSOR: _____ AREA/ ACTIVITY: _____ DATE:_____

SCOPE OF ASSESSMENT: _____

1. **Environmental Aspects** - List major raw materials and natural resources used (including fuel). Note any potential significant environmental impacts:

Products/Raw Material/Resource for fuels list type, estimated quantity (BTU/hr, KWH, etc.)	Potential Significant Air Impact? Yes or No?	Potential Significant Water Impact? Yes or No?	Potential Significant Solid Waste Impact? Y/N?	Potential for contamination to land? Yes or No?	Any SARA Chemical used? Yes or No?

2.(a.) **Emissions to Air:** From table 1 above, list all significant air emissions sources from this process and potential significants if not properly controlled.

Description	Point Source ID	Source Type	Pollutant >5 TPY criteria or 1000 lbs.HAPS	P2 Control Used including practices and procedures	Monitoring and Measurement Techniques

b.) **Releases to Water** - From table 1 above list all oil, chemical products, raw materials, products, by-products and other potential pollutant sources which interact with stormwater or enter the sanitary sewer system, process water treatment system or groundwater streams.

Impact Source	Water System Entered (SW/STP/PW/GW)	Point Source Outfall #	P2 Control including practices and procedures	Monitoring and Measurement techniques

c.) **Waste Management** - From table 1 above list all by-products and waste streams generated in quantities of either >5 tons per year for by-products / solid waste or in any amount for a hazardous or special waste.

Waste Description	Characterization	Disposal Method	P2 Control including practices and procedures	Monitoring and Measurement techniques

d.) **Chemical Products** - From table 1 above list substances stored, processed, or otherwise used in quantities greater than the threshold planning and reporting quantities as specified under SARA Title III including 311, 312, and 313 requirements. Threshold quantities will vary depending on the level of the hazard presented by the subject chemical.

Raw Material Description	SARA Chemical	Description of how used	P2 Control including practices and procedures	Monitoring and Measurement techniques

e) **Contamination of Land** - Describe any significant potential for or evidence of contamination of the land and recommended or planned actions for pollution prevention or mitigation.

f) **Impact on Community** - List impacts (adverse and beneficial) this process could potentially have on the community.

g) **Energy/Natural Resources**- List all processes utilizing combustion energy in quantities greater than 1 million BTU/Hour or raw materials in quantities greater than 5 tons/year that were not already listed in one of the previous categories.

h) List any emergency response and preparedness considerations:

3. **Applicable regulatory requirements:**

a)Other Local Environmental Issues:

4. **List any known Compliance Issues:**

1. PURPOSE

This purpose of this procedure is to describe the method used to systematically evaluate environmental aspects and associated impacts of relevant activities and services at NNBNA.

2. SCOPE

This procedure applies to all NNBNA personnel doing environmental aspect and impact identification.

All new projects, new equipment, or significant process changes will require an analysis with submittal of one of the following:

1) an Investment Application (IA)
2) an Equipment Change Notice (EQCN)
3) an Engineering Work Request (EWR)

The analysis will be conducted by the initiating department.

In addition, where appropriate, all departments should conduct an environmental aspect and impact analysis for significant procedural or process changes.

3. DESCRIPTION

3.1 Definitions

A&IA = Aspect and Impact Analysis

Environmental Aspect - element of an organization's activities, products or services that can interact with the environment

Environmental Impact - any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services

Greenhouse gas - A gas that increases global temperatures by trapping solar radiation near the Earth's surface typically carbon dioxide, water vapor, nitrogen oxides, ozone, and CFCs. This includes most gaseous byproducts of fossil fuel combustion.

Nonrenewable resource - Any resource that cannot last indefinitely or is consumed faster than it is replenished.

Ozone deleter - A compound that contributes to stratospheric ozone depletion. Any material listed as an ozone depleter under title VI of the Clean Air Act.

Rating - a 'first pass' scoring by the initiating department at the time the A&IA is filled out (see section 3.5 below)

Renewable Resource - A resource that can last indefinitely without reducing the natural supply, such as solar power, wind energy, surface water.

3.2 Departmental/Functional Group Activities

Each department will establish the activities to be evaluated in the Aspect and Impact Analysis.

3.3 Aspect and Impact Worksheet

Activities will be evaluated using the Aspect & Impacts Analysis Work Sheet (http://nnbna/quality/QS Forms/Aspect&Impact.xls). Each activity or group of similar activities should be evaluated separately and listed under the column titled ACTIVITY. Abnormal or upset conditions should also be evaluated for each activity.

Equipment and process drawings relevant to the activities should be attached, as appropriate. A sketch of the activity can also be made at the bottom left of the form in the area designated as 'PROCESS OR EQUIPMENT SKETCH'.

3.3.1 Environmental aspects

Aspects for each activity, including inputs and outputs corresponding to each aspect, should be recorded in the column titled ENVIRONMENTAL ASPECT, selecting the appropriate code(s) from the following list

ACCIDENTAL SPILLAGE	AS
AIR EMISSIONS	AE
SOLID WASTE	SW
ENERGY CONSUMPTION	EC
ENVIRONMENTAL NOISE	EN
GROUND WATER	GW
HAZARDOUS WASTE	HW
ODOR EMISSIONS	OE
PROCESS WASTE WATER DISCHARGE	PWW
DISCHARGE TO SPENT BIOMASS	SBM
OTHER PROCESS WASTE	OPW
WATER CONSUMPTION	WC
RAW MATERIAL CONSUMPTION	RMC
STORMWATER DISCHARGE	SD
OTHER ENVIRONMENTAL ASPECT	OEA

3.3.2 Environmental impacts

For each aspect identified, all potential environmental impacts should be recorded in the column titled ENVIRONMENTAL IMPACT, selecting the appropriate code(s) from the following list

AIR QUALITY -PARTICULATES	AQ-P
AIR QUALITY-TOXIC VAPOR	AQ-TV
AIR QUALITY-OZONE DEPLETION	AQ-OZ
AIR QUALITY-GREENHOUSE GASES	AQ-GG
EXCESS NOISE	XN
GROUND WATER QUALITY	GWQ
SOIL QUALITY	SQ
SURFACE WATER QUALITY	SWQ
DEPLETION OF LANDFILL SPACE	DLS
DEPLETION OF NONRENEWABLE RESOURCES	DNR
DEPELETION OF RENEWABLE RESOUCES	DRR
OTHER ENVIRONMENTAL IMPACT	OEI

Inputs will typically have environmental impacts that are separate from those of outputs. Use separate lines for evaluating the impacts of inputs versus outputs.

Activities with positive environmental impacts (e.g. recycling, water reduction) are indicated in the next column.

3.4 Controls Evaluation

For each environmental impact, controls should be evaluated using the next two columns.

The column titled CONTROLS IN PLACE should be used to indicate whether controls are in place now (yes or no).

The column titled CAN CONTROLS BE IMPROVED should be used to indicate whether existing controls can be improved (yes, maybe, or no).

Additional information regarding the activity, aspect, impact, and/or controls should be made in the COMMENTS column.

3.5 Rating Codes

For each impact listed, a rating code should be indicated in the column titled RATING. A description of rating categories is located in the upper left of the form and includes the following categories:

Rating	Description
1	Activity needs attention now, or there is an uncontrolled impact
2	Possible control improvements, or there is a potential significant impact
3	Current controls are acceptable, or there is no potential significant impact

3.6 Disposition

Completed forms should be returned to the EQS Steering Committee and will be entered into the A&IA database (w:\eqs\Aspects-Impacts Worksheets\Aspects & Impacts Data Collection).

4. DOCUMENTS

Aspects & Impacts Analysis Worksheet (http:/nnbna/QS Forms/Aspect&Impact.xls)

5. RESPONSIBILITY

The EQS Steering committee has responsibility for this document.

6. REFERENCES

NA

NNBNA E l Quality System
Aspects & Impacts Analysis Work Sheet

Department_____ Date: _____

Process/Equipment _____ Initials: _____

Rating Codes:
1 = Activity needs attention now or there is an uncontrolled impact
2 = Possible control improvements or there is a possible significant impact
3 = Current controls are acceptable or there is no potential significant impact

Activity	See Aspects Codes Environmental Aspect		See Impacts Codes Environmental Impact	Check if Positive Impact	Control			Rating
	Inputs	Outputs			Controls in place(yes/no)	Can controls be improved (yes/no/maybe)	Comments	
#1 (normal conditions)								
#2 (abnormal conditions)								
#3 (normal conditions)								
#4 (abnormal conditions)								

Process or Equipment Sketch

Aspects Codes
AS = Accidental Spillage
AE = Air Emissions
SW = Solid Waste
EC = Energy Consumption
EN = Environmental Noise
GW = Ground Water
HW = Hazardous Waste
OE = Odor Emissions
PWW = Process Waste Water Discharge
SBM = Discharge to Spent Biomass
OPW = Other Process Waste
WC = Water Consumption
RMC = Raw Material Consumption
SD = Storm Water Discharge
OEA = Other Environmental Aspect

Impacts Codes
AQ-P = Air Quality - Particulate
AQ-TV = Air Quality- Toxic Vapor
AQ-OZ = Air Quality- Ozone Depletion
AQ-GG = Air Quality- Greenhouse Gases
XN= Excess Noise
GWQ = Ground Water Quality
SQ = Soil Quality
SWQ = Surface Water Quality
DLS = Depletion of Landfill Space (Solid Waste)
HWD = Hazardous Waste Disposal
DRR = Depletion of Renewable Resources
DNR = Depletion of Non-Renewable Resources
OEI = Other Environmental Impact

Environment

Document Revision: Section 3.2 ranking to be done by grouping impacts. Section 3.4 removed. Section 3.6 removed.

1. PURPOSE

This document will describe and explain the aspect and impact ranking scoring system procedure.

2. SCOPE

This is a site-wide document, applicable to all departments.

3. DESCRIPTION

3.1 Aspects/Impacts

Aspect/Impact Analysis is to be preformed as described in QS.EQ.1004.

Definitions:

Environmental Aspect - element of an organization's activities, products or services that can interact with the environment

Environmental Impact - any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services

3.2 Impact Ranking

Following the Aspect & Impact Analysis, similar impacts will be grouped together. A ranking will then be done by the EQS Steering committee on each group of like impacts.

a) Using the Impact Scoring system, a numerical value is entered into the appropriate space on the impact ranking chart and those values are added to receive the total.

	High (5)	4	Medium (3)	2	Low(1)	0
Area of Impact	Regional (neighbors and regional		Local (site only)		Departmental	No Impact
Quantity of Impact	Relative amount due to aspect defined					No Impact
Probability of Impact	Relative amount due to aspect defined					No Impact
Potential Regulatory or Legal Exposure	Liable to civil action		Liable to environmental prosecution/penalty		Attract attention or caution from government agencies	No Impact
Public Relation and/or Community Concerns	Leading media item, state or national groups concerned, would seriously harm national marketing		Local media item, local groups concerned, would cause damage to local image		Some media inquiry, few individuals concerned	No Impact
Cost Recovery Period	1 year		3 years		5 years	No Payback
Health Risk	Serious health risk, major concern for human safety		Short term effects to inhalation and skin contact		Minor discomfort or irritation	No Impact

3.3 Practicability Ranking

a) Using the Practicability Scoring system, a numerical value is entered into the appropriate space on the practicability ranking chart and the values added to receive the total.

	High (5)	4	Medium (3)	2	Low (1)	0
Controls in Place	Excellent controls in place		Good controls in place		Few controls in place	No controls in place
Difficulty of Reducing Impact	Involves use of new technology, or materials which are not yet proven in production		Major modification to equipment or new machine using same technology; Alternative materials already used elsewhere		Change to work practice, auxiliary equipment	OP training and/or procedure changes
Cost of Reducing Impact	More than $100,000		≈ $50,000		Less than $25,000	Less than $5,000

3.4 Total Score

Subtract the total practicability from the total impact to receive the total score.

4. DOCUMENTS

Impact and Practicability Scoring Worksheet: http://nnbna/quality/QS Forms/Impact Scoring

5. RESPONSIBILITY

The responsibility for this document lies with the EQS Steering Committee.

6. REFERENCES

ISO 14001-1996, Environmental Management Systems – Specification with Guidance for Use

Impact Scoring Worksheet

Activity: _____

Date: _____

Initials: _____

POTENTIAL IMPACTS	RANKING OF SIGNIFICANCE							
	AREA OF IMPACT	QUANTITY OF IMPACT	PROBABILITY OF IMPACT	POTENTIAL REGULATORY OR LEGAL EXPOSURE	PUBLIC RELATION AND/OR COMMUNITY CONCERNS	COST RECOVERY PERIOD	HEALTH RISKS	TOTAL

PRACTICABILITY RANKING				
POTENTIAL IMPACTS	CONTROLS IN PLACE	DIFFICULTY OF REDUCING IMPACT	COST OF REDUCING IMPACT	TOTAL

TOTAL RANKING		
TOTAL FROM IMPACT RANKING	LESS TOTAL PRACTICABILITY RANKING	TOTAL SCORE

Reviewed by: Steering Committee Initials: _____ Date: _____

Naval Aviation Depot, CA

ISO 14001 Procedure

Title	Document Effectivity	Status
Environmental Aspects	First Issue Date 01/22/1999 Revision Date 01/22/2000	Issued
EMS Procedure No	**EMSMR**	Rev
EMSP431	Melito M Barrera/NI/NADEP	1

Purpose

To identify PAS that NADEP can control and over which it can be expected to have an influence in order to determine EAs that are significant and have SEIs.

Scope

This procedure describes the process for the identification of EAs and the selection of SEAs. These SEAs are considered in setting objectives and targets (see EMSP 433). This process will also consider input from EMSP 432, EMSP 434, EMSP 446b, and EMSP 447.

Responsible Party	Responsibilities
EMS MR	• Initiates and coordinates the SEA selection process. • Coordinates the activities of the EIT.
OUMR	• Supports the EMS MR in the SEA selection process. • Performs an assessment of the OU to determine improvements to be made.
OUM	• Ensures that the OUMR is provided with appropriate resources for the SEA selection process.
EIT	• Reviews the proposed SEA improvement projects for concurrence with the OUMR.
EPO	• Provides support to the OUMR in identifying EAs and EIs that may be significant.

PROCEDURE

1. **Identification of EAs**

a. PFDs will be prepared by the OUMR to identify those PAS, inputs, outputs and responsible parties associated with the OU's operations.

b. PFDs will be reviewed and updated by the OUMR each EMS cycle (see EMSP 46) to ensure that they reflect current business operations at the OU, shop or code level.

c. At the request of the EMS MR, the OUMR will identify the EAs associated with its PAS over which the OU has control and can be expected to have an influence. An EA can be an input, output, or

the PAS, itself.

d. The OUMR will enter data on an EA Entry Form, constructed from the PFDs, to:

- Correlate PAS with inputs and outputs;
- Relate the EAs to responsible parties;
- Evaluate EIs associated with potential accidents and emergencies (see EMSP 447).

e. The EPO may assist the OUMRs in identifying the EIs associated with EAs at the direction of the EMS MR.

f. The EMS MR will initiate the EA identification process at each EMS cycle.

2. Identification of SEAs

a. The EMS MR will initiate the SEA identification process at each EMS cycle (see EMSP 46).

b. Once the OUMR has identified EAs associated with its PAS, the OUMR will determine if any of the EAs are significant (an SEA). The OUMR may use the following criteria to determine if an EA is significant:

- The EA has legal or other regulatory requirements associated with it (see EMSP 432, EMSP 446b, and EMSP 447)
- The EA causes significant impacts to the environment;
- The EA is important, meaningful, or vital to the mission of the organization and/or the PAS;
- The EA significantly impacts costs, efficiency, and/or quality; or
- The EA lends itself to the prevention of pollution.

c. The OUMR will propose improvement projects associated with SEAs using the EA Entry Form. The determination to propose an improvement project indicates the EA is significant (an SEA).

---

3. SEA Improvement Project Selection Process

a. Proposed improvement projects associated with SEAs are evaluated by the OUMR and the EIT, using a Criteria Sheet.

- Proposed improvement projects that can create either a non-compliant or unsafe work condition are rejected and the remainder of the Criteria Sheet is not completed. This determination may be made by either the OUMR or the EIT.
- Proposed improvement projects are evaluated, first, by the OUMR using aCriteria Sheet. (See the Guidelines for Completing the Criteria Sheet.)
- After the OUMR's initial evaluation of the proposed improvement

project, it is evaluated a second time by the EIT, also using a Criteria Sheet. The evaluation may result in recommendations from the EIT to the OUMR to reconsider, withdraw, or modify the proposed improvement project.

- Proposed improvement projects that are required to be implemented because they have a legal or other regulatory requirement associated with them (see EMSP 432, EMSP 446b, and EMSP 447) do not require to be evaluated using a Criteria Sheet. Instead, an EMP form (see EMSP 434) is completed by the OUMR or the EMS MR to propose objectives and targets (see EMSP 433).

b. The EMS MR will list the Criteria Sheet scores, and the average of the EIT and OUMR scores, for each improvement project proposed by an OU.

c. The OUMR and/or the OUM will consider the Criteria Sheet scores and indicate which, if any, of the proposed improvement projects they choose to implement during the current EMS cycle (see EMSP 46) by preparing an EMP form (see EMSP 434). The completed EMP form is used to propose objectives and targets in EMSP 433.

d. The EMS MR will maintain the records of the evaluation process according to EMSP 453.

4. General Guidance

a. Completion of objectives and targets (see EMSP 434) may result in the creation of new EAs and EIs and should be considered when identifying new SEAs.

References

ISO 14001:1996, Section 4.3.1

EMSP 432 Legal and Other Requirements

EMSP 433 Objectives and Targets

EMSP 434 Environmental Management Program

EMSP 446b Suppliers of Goods and Services

EMSP 447 Emergency Preparedness and Response

EMSP 453 Records Management

EMSP 46 Management Review

EA Entry Form

Criteria Sheet

Guidelines for Completing the Criteria Sheet

Document Edited By:
Form Rev 1.0.2 15 APR 2000

- *A direct link to DEQ's strategic planning and budgeting process;*
- *Appropriate procedures and training; and*
- *Performance measures, self-assessment, and independent assurance reviews.*

Dennis H. Treacy, Director
Virginia Department of Environmental Quality

This Environmental Policy shall be communicated to all employees by the EMS Manager and maintained on DEQ's website by the Public Affairs Manager.

2. Environmental Aspects, Objectives and Targets, and Environmental Management Programs

2.1. Environmental Aspects

Each year, in the month of February, the EMS Program Team (see Structure and Responsibility, §4) shall 1) develop an inventory of DEQ's environmental aspects and impacts, 2) determine which aspects are potentially significant impacts and 3) use this information in establishing environmental objectives and targets for the upcoming fiscal year.

The results of exercising this procedure shall be maintained by the EMS Manager in a document that records the findings of the EMS Program Team, the environmental objectives and targets, the management programs and plans for achieving them, and progress toward achieving environmental objectives and targets.

2.2. Objectives and Targets

Concurrent with its determination in February of each year as to which of DEQ's environmental aspects are potentially significant environmental impacts, the EMS Program Team shall establish environmental objectives and targets for the upcoming fiscal year. These Environmental Objectives and Targets shall be documented and maintained by the EMS Manager.

2.3. Environmental Management Programs

Concurrent with its determination in February of each year as to which of DEQ's environmental aspects are potentially significant environmental impacts and its establishment of Environmental Objectives and Targets, the EMS Program Team shall establish management plans and programs to achieve the environmental objectives and targets for the upcoming fiscal year. These management plans and programs shall include designation of person(s) responsible for their achievement, means and methods of achievement, and timeframes for achievement. These Management Plans and Programs shall be documented and maintained by the EMS Manager.

3. Legal and Other Requirements

In line with DEQ's Environmental Policy commitment to complying *"with all applicable environmental laws and regulations,"* the Director shall require the Director of Administration and each of the Regional Directors to compile archives of relevant environmental laws,

Provided courtesy of Johnson Controls, Inc., Automotive Systems Group

Instructions for Environmental Aspect Identification Form

Responsibilities

The facility Cross Functional Team (CFT) led by the Management Representative (MR) is responsible for completing this 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. The facility CFT compares the resulting material balance and list of facility-specific aspects to any information available in the form of generic "HSE Process Profiles" produced for similar type processes or activities.

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 and managed as defined in the Environmental Aspects Control Plan form.

Conducting a Material Balance

The material balance consists of identifying all raw materials, chemicals, and utilities used as input 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.

1.0 Record the Plant Name, Process/Activity Name, and Location.

2.0 Provide a description of the process/activity.

3.0 Determine and record if the Process/Activity is a Contracted Process/Activity.

4.0 Record Material Inputs and Outputs. If the Process/Activity is installed or in place, conduct the identification by means of physical inspection.

Raw material inputs

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

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Process Output

- List all products produced by the process specifically produced for sale. Recyclable and Chemical By-Product (e.g. Rebond) outputs are entered in the waste section.
- List all air emissions whether they are drawn directly through a stack or are discharged into the room and escape as fugitive emissions. Include noise and odor as an air emission if potentially noticeable outside the facility.
- Enter 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
- Check the recycled box if the material is currently recycled, internally or externally. It does not include materials that go directly back into the process (i.e., Calibration shots returned to day tanks, etc.)
- Include containerized wastewater transported off-site.
- 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. In the bottom portion of the wastewater section, list any treatment that occurs before the water is discharged.

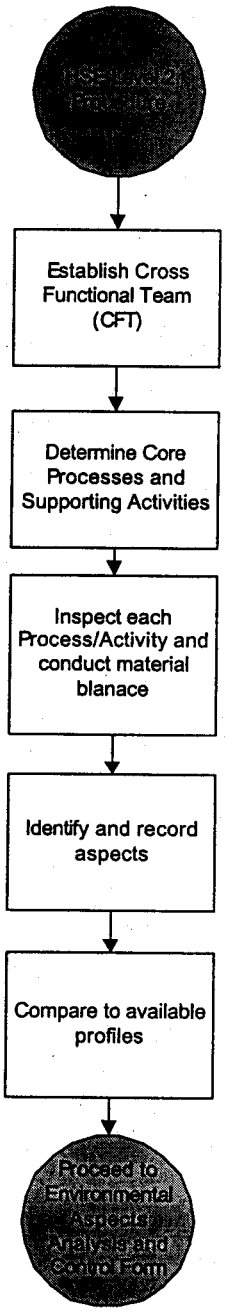
5.0 Compare the completed form to any information available in the form of generic "HSE Process Profiles" produced for similar type processes or activities.

6.0 Sign and date the form with the date the form was completed or revised.

7.0 Collect all completed Aspect Identification forms and enter data into the supporting Environmental Aspect Control Plan form.

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Environmental Aspects Identification Process Overview

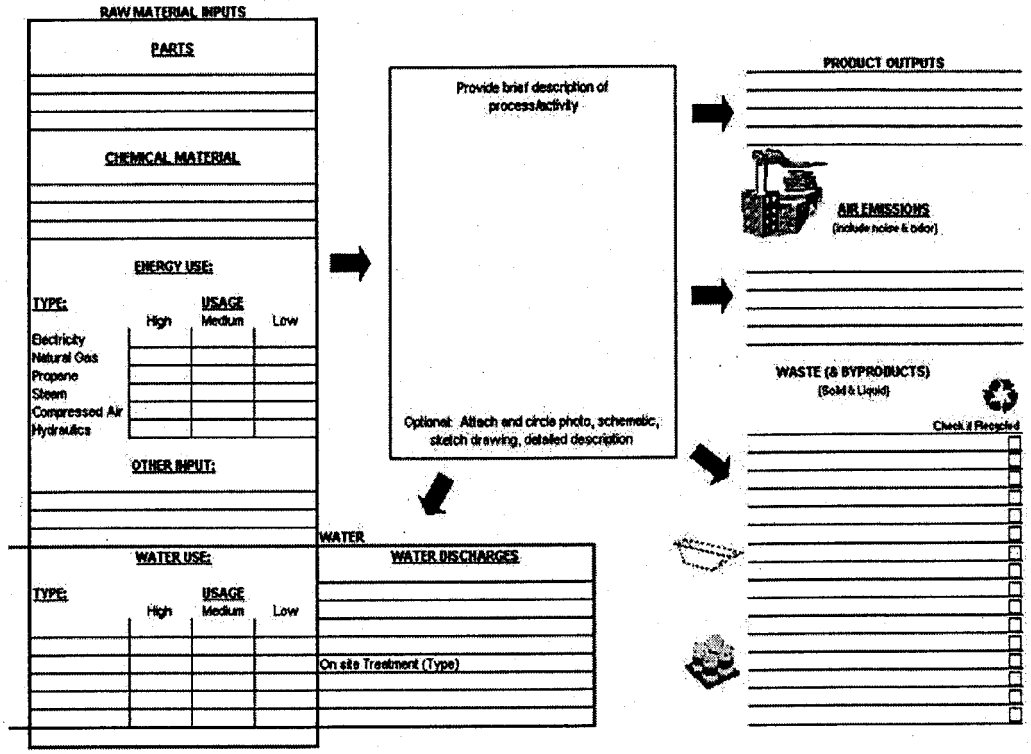


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ENVIRONMENTAL ASPECTS IDENTIFICATION

Plant: _____ Process/Activity: _____

Contracted? _____ Process/Activity Location: _____



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ENVIRONMENTAL ASPECTS & IMPACTS WORKSHEET

Department: _____ Date: _____

EMS Audit Guide: _____

Survey Team: _____

IMPACTS

ASPECTS	Air Pollution	Water Pollution (Sanitary)	Water Pollution (Ground / Outside)	Contamination of Land	Consumption of Utilities (Electricity / Water)	Consumption of Non-Renewable Resources	Nuisance (Noise, Light, Trash, Etc.)	Non-Hazardous Solid Waste Landfill	Hazardous Waste	Other	Comments

KEY: L= Low impact, M= Medium impact, H= High impact, ("+" = Positive, "-" Negative impact to the environment)

from Epson Portland, Inc.

ISO 14001
Environmental aspects and impacts
Examples

The relationship between aspects and impacts is one of cause and effect. The term "aspects" is neutral, so keep in mind that your environmental aspects could be either positive (such as making a product out of recycled materials) or negative (such as discharge of toxic materials to a stream). EPI is not expected to manage issues outside its sphere of influence. For example, while we have control over how much electricity we use, however we do not have control over the way in which the electricity is generated. Once you have identified the environmental aspects of your item, part, or process you need to determine which impact it has on the environment.
You need to think about these aspects and impacts on how it effects EPI through the end user.

Definitions and Examples:

Environmental aspect	Element of an organization's activities, products or services that can interact with the environment.
Environmental impact	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services.
Air Pollution	Contamination of air by the discharge of harmful substances. Does the item, part, or process have the potential to emit anything into the air? Is the item a flammable or combustible liquid?
Water Pollution (sanitary)	Contamination of water by the discharge of harmful substances. Will the item, part, or process have a potential to go down the sanitary drain?
Water Pollution (Ground/Outside)	Contamination of water by the discharge of harmful substances. Will the item, part, or process have a potential to go into creeks, streams, and waterways?
Non-hazardous solid waste going to landfill	This item, part, or process would be considered garbage. It is not a hazardous waste, it can not be recycled or disposed of in any other way. **NOTE**: It would be a positive impact if the item, part, or process can be recycled or disposed of in a environmental friendly manner.
Hazardous Chemical	Isopropyl Alcohol, Flux, Solder, Cleaning solvents, oils, greases,
Non-renewable resource	this would be raw materials, plastics, metals, petroleum products Solder, oils, greases, gasoline, stretch rap, plastic parts, and metal parts.
Consumption of utilities	Will the item, part, or process consume electric, gas, water?
Contamination of land	Will the item, part, or process absorb into the land?
Other	Anything you can think of that is not on this list. A change in record keeping, a document like work instructions or procedures.

ENVIRONMENTAL ASPECTS & IMPACTS WORKSHEET

Department: Ink Jet Head 119

EMS Audit Guide: Rick Rush

Survey Team: George Lundberg / Rick Rush

Date: September 13 1999

IMPACTS

ASPECTS	Air Pollution	Water Pollution (Sanitary)	Water Pollution (Ground / Outside)	Contamination of Land	Consumption of Utilities (Electricity / Water)	Consumption of Non-Renewable Resources	Nuisance (Noise, Light, Trash, Etc.)	Non-Hazardous Solid Waste Landfill	Hazardous Waste	Other	Comments
Mini warehouse					L-			L- H+			Recycling plastic trays
Connect machine	L-				L-			L-	H-		IPA / FLUX hazardous waste
Crack check machine					L-						
ASW machine					L-						
High / Low temperture area					M-						
Shipping liquid machine					L-						
Final / shipping area											
Trans. Nonhazardous waste										L-	Work instruction (waste water)
Office equipment					L-			L-			
Air cleaning system					M-			L-			

KEY: L= Low impact, M= Medium impact, H= High impact, ("+" = Positive, "-" Negative impact to the environment)

Epson Portland Inc.

Department's Significant Aspects

Department: Ink Jet Head

Significant Aspects	Environmental Impacts
IPA / Flux	Hazardous Waste
Recycling plastic trays	Non-hazardous solid waste to landfill

ENVIRONMENTAL ASPECTS & IMPACTS WORKSHEET

Department: Core Engineering

EMS Audit Guide: George Lundberg

Survey Team: George Lundberg / Gerry Snell

Date: 4/15/99

IMPACTS

ASPECTS	Air Pollution	Water Pollution (Sanitary)	Water Pollution (Ground / Outside)	Contamination of Land	Consumption of Utilities (Electricity / Water)	Consumption of Non-Renewable Resources	Nuisance (Noise, Light, Trash, Etc.)	Non-Hazardous Solid Waste Landfill	Hazardous Waste	Other	Comments
Space planning					L-						
Business development	H+ H-	H+ H-	H+ H-	H+ H-	H+ H-	H+ H-	H+ H-	H+ H-	H+ H-		
EPL support / process eng.					L-						
Environmental&Safety Engineer	H+ H-	H+ H-	H+ H-	H+ H-	H+ H-	H+ H-	H+ H-	H+ H-	H+ H-		
Office area					L-						
Printer / copier toner										L-	Treated like Haz. Waste (Incinerated)
New production introduction	H+ H-	H+ H-	H+ H-	H+ H-	H+ H-	H+ H-	H+ H-	H+ H-	H+ H-		

KEY: L= Low impact, M= Medium impact, H= High impact, ("+" = Positive, "-" Negative impact to the environment)

Epson Portland Inc.

Department's Significant Aspects

Department: Core Engineering

Significant Aspects	Environmental Impacts
Business development	All impact
Environmental & Safety Engineer	All impact
New product introduction	All impact

ENVIRONMENTAL ASPECTS & IMPACTS WORKSHEET

Department: Human Resources 411

EMS Audit Guide: Susan Underwood

Survey Team: George Lundberg / Susan Underwood

Date: 4/5/1999

IMPACTS

ASPECTS	Air Pollution	Water Pollution (Sanitary)	Water Pollution (Ground / Outside)	Contamination of Land	Consumption of Utilities (Electricity / Water)	Consumption of Non-Renewable Resources	Nuisance (Noise, Light, Trash, Etc.)	Non-Hazardous Solid Waste Landfill	Hazardous Waste	Other	Comments
Office equipment					L-						
Non-recycled products (trash)								L-			
Recycled fibers								L+			
Printer/copier toner										L-	Treated like haz.waste (incinerated)
Janitorial service								L-L+	H-		Bloodborne Pathogen clean up
Training (EMS)	H+	H+	H+	H+	H+	H+	H+	H+	H+	H+	EMS Training for all employees
Security										H	Emergency Response

KEY: L= Low impact, M= Medium impact, H= High impact, ("+" = Positive, "-" Negative impact to the environment)

Epson Portland Inc.

Department's Significant Aspects

Department: Human Resources

Significant Aspects	Environmental Impacts
Bloodborne Pathogen Waste	Hazardous Waste
EMS Training	All Environmental Impacts
Security	*Other (Emergency Response)*

ENVIRONMENTAL ASPECTS & IMPACTS WORKSHEET

Department: Cafeteria phase II & III

EMS Audit Guide: Sue Underwood

Survey Team: George Lundberg / Sue Underwood

Date:

IMPACTS

ASPECTS	Air Pollution	Water Pollution (Sanitary)	Water Pollution (Ground / Outside)	Contamination of Land	Consumption of Utilities (Electricity / Water)	Consumption of Non-Renewable Resources	Nuisance (Noise, Light, Trash, Etc.)	Non-Hazardous Solid Waste Landfill	Hazardous Waste	Other	Comments
Storage area											No Impact
Kitchen preparation Area		L-			M-			L- L+			
Cooking area	L-				M-			L- L+			
Food serving area		L-			L-						
Dinning area					L-			M-			Wet garbage
cooking oil waste										L+	Recycled

KEY: L= Low impact, M= Medium impact, H= High impact, ("+" = Positive, "-" Negative impact to the environment)

Epson Portland Inc.

Department's Significant Aspects

Department: Cafeteria phase II & III

Significant Aspects	Environmental Impacts
None	None

ENVIRONMENTAL ASPECTS & IMPACTS WORKSHEET

Department: Outside

EMS Audit Guide: George Lundberg

Survey Team: George Lundberg / Cheri Huffman

Date: March 12 1999

IMPACTS

ASPECTS	Air Pollution	Water Pollution (Sanitary)	Water Pollution (Ground / Outside)	Contamination of Land	Consumption of Utilities (Electricity / Water)	Consumption of Non-Renewable Resources	Nuisance (Noise, Light, Trash, Etc.)	Non-Hazardous Solid Waste Landfill	Hazardous Waste	Other	Comments
Parking lots			L- L+						L-	L-	Potential for spill / Items left in parking lot
Loading areas			L- L+						L-		Potential for spill
Natural gas lines					L-	L-					
Transformers					L-	L-					
Trees	L+										
Commercial vehicles	M-		L-								
Employee vehicles	H- H+		L-								
Company vehicles	L-		L-								
Construction areas (on site)			L-				L-				
Construction areas (off site)			L-								

KEY: L= Low impact, M= Medium impact, H= High impact, ("+" = Positive, "-" Negative impact to the environment)

Epson Portland Inc.

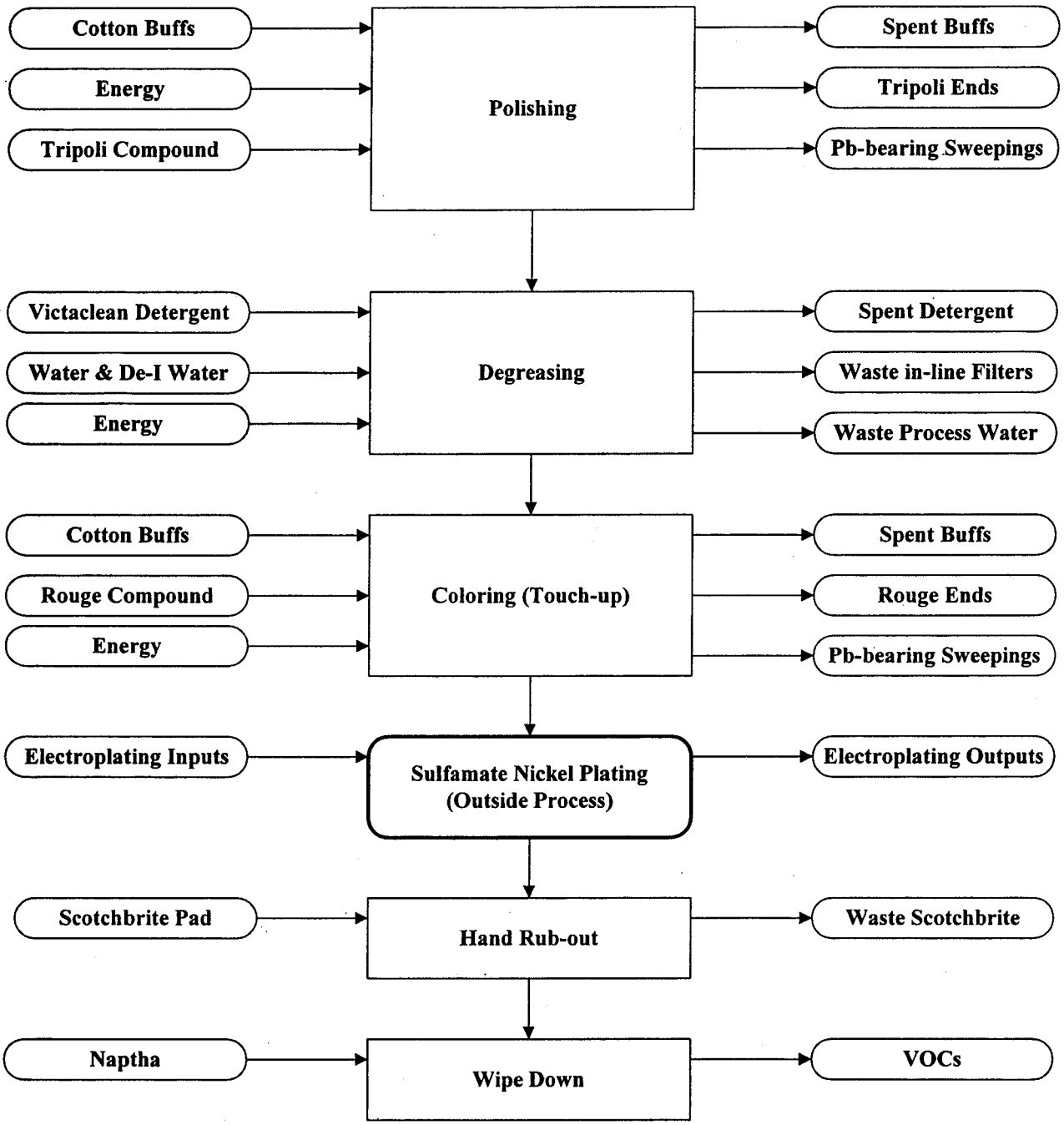
Department's Significant Aspects

Department: Outside

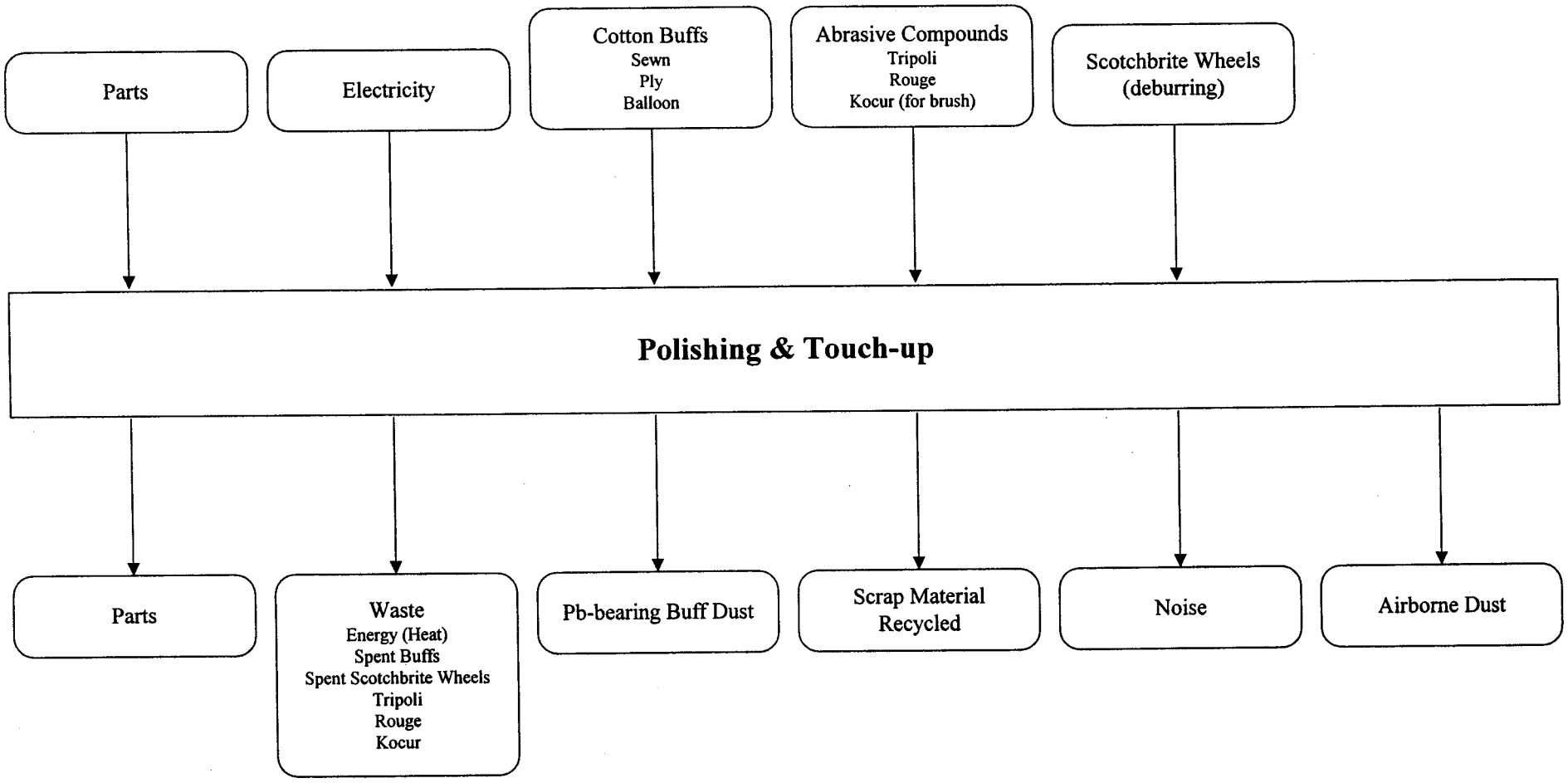
Significant Aspects	Environmental Impacts
Employee vehicles	Air Pollution

from Rejuvenation Inc

Brushed Nickel (BN) Metal Finishing Process



METAL FINISHING
Polishing I/O Detail



Aspects Analysis

Rejuvenation Manufacturing

The Natural Step Four System Conditions	In order for society to be sustainable, nature's functions and diversity are not systematically:
Extraction	**1) ...subject to increasing concentrations of substances extracted from the Earth's crust;**
Persistency & Toxicity	**2) ...subject to increasing concentrations of substances produced by society; or**
Biodiversity	**3) ...impoverished by overharvesting or other forms of ecosystem manipulation.**
Efficiency & Social Equity	**4) And, resources are used fairly and efficiently in order to meet basic human needs worldwide.**
Frequency of Activity	**What is the frequency of the activity during an average work day?**

Point	Extraction	Persistency	Toxicity	Biodiversity	Efficiency	Social Equity	Frequency
1	100% Recycled	Biodegrade < 1 day	Base Mat'l Non-Toxic	Sustainably Harvested Ecosystem Complex	Local Source Small % Landfilled High energy efficiency	Min Compensation of Position's Range has "Fair Pay"	Rarely
2							
3	Mixed	Biodegrade <= 1 month	Moderately Toxic	Mixed	Mixed	Mid Compensation of Position's Range has "Fair Pay"	Occasionally
4							
5	Mined	Biodegrade > 1 month	Acutely Toxic	Nature is consumed Ecosystem Simplified	Distant Source High % Landfilled Low Energy Efficiency	Max Compensation of Position's Range has "Fair Pay"	Continuously

Aspects Analysis

Rejuvenation Manufacturing

	"The Natural Step" System Conditions						TNS	Frequency	Aspect	Regulated	
	Extraction	Persistency	Toxicity	Biodiversity	Efficiency	Equity	Subtotal	of Activity	Score	Yes/No	Impact
FACILITY OVERHEAD											
Storm Water Drainage	1	2	2	2	1	1	9	3	12	Yes	Water Quality
General Energy Use	4	3	2	5	4	4	22	4	22	No	Air Quality/Endangered Species
MATERIAL HANDLING											
Receiving	3	3	1	3	3	3	16	3	19	No	Solid Waste
Inspection	3	4	2	2	3	3	17	3	20	No	Solid Waste
Warehousing	2	4	1	2	3	4	16	4	19	No	Solid Waste
Scheduling	1	2	1	1	1	3	8	5	13	No	Solid Waste
MATERIAL PREP											
Tube Polishing	4	3	2	2	1	4	15	3	18	Yes	Haz Mat/Solid Waste
Tube Cutting	3	5	1	2	1	4	15	4	19	No	Solid Waste
Tube Threading	2	5	1	2	1	4	14	2	16	No	Solid Waste
Soldering	5	4	3	2	1	4	18	1	19	No	Air Quality
Tumbling	3	2	1	3	1	4	13	4	17	Yes	Water Quality
Grinding	4	4	1	2	1	4	15	2	17	No	Solid Waste
Machine Metalwork	3	3	3	2	1	4	15	2	17	No	Solid Waste
Scrap & Reject Recovery	3	4	1	1	1	4	13	1	14	No	Solid Waste
METAL FINISHING											
Sandblasting	5	1	1	4	3	4	15	4	19	No	Solid Waste
Polishing/Touch-up	3	5	3	5	3	4	20	5	25	Yes	Haz Mat/Solid Waste/Energy
Degreasing	2	3	2	3	1	4	14	5	19	Yes	Water Quality
Antiquing	5	5	4	4	1	4	22	5	27	Yes	Water Quality
Hand Rub-out	4	4	2	1	1	4	15	5	20	No	Solid Waste
Lacquering	5	5	3	3	1	4	20	5	25	Yes	VOC/Air Quality
Painting	5	5	3	3	2	4	20	4	24	Yes	VOC/Air Quality
ASSEMBLY											
Wiring	5	5	1	1	2	4	16	5	21	No	Solid Waste
Allthread Cutting	5	5	1	1	2	4	16	5	21	No	Solid Waste
Assembly	1	3	1	1	1	4	10	5	15	No	Solid Waste
Glass Cutting/Insertion	4	1	2	1	2	4	12	3	15	No	Solid Waste
QUALITY											
Electrical Test (UL)	1	1	1	2	1	3	8	5	13	No	Low Impact
Product Assy/Finish Check	1	1	1	1	1	3	7	5	12	No	Low Impact
DISTRIBUTION											
Packing Prep	4	5	2	3	2	4	18	5	23	No	Solid Waste
Pack	3	3	2	4	2	4	16	5	21	No	Solid Waste

Rated 5 because we use hydro power, and this impacts salmon (endangered species listing)

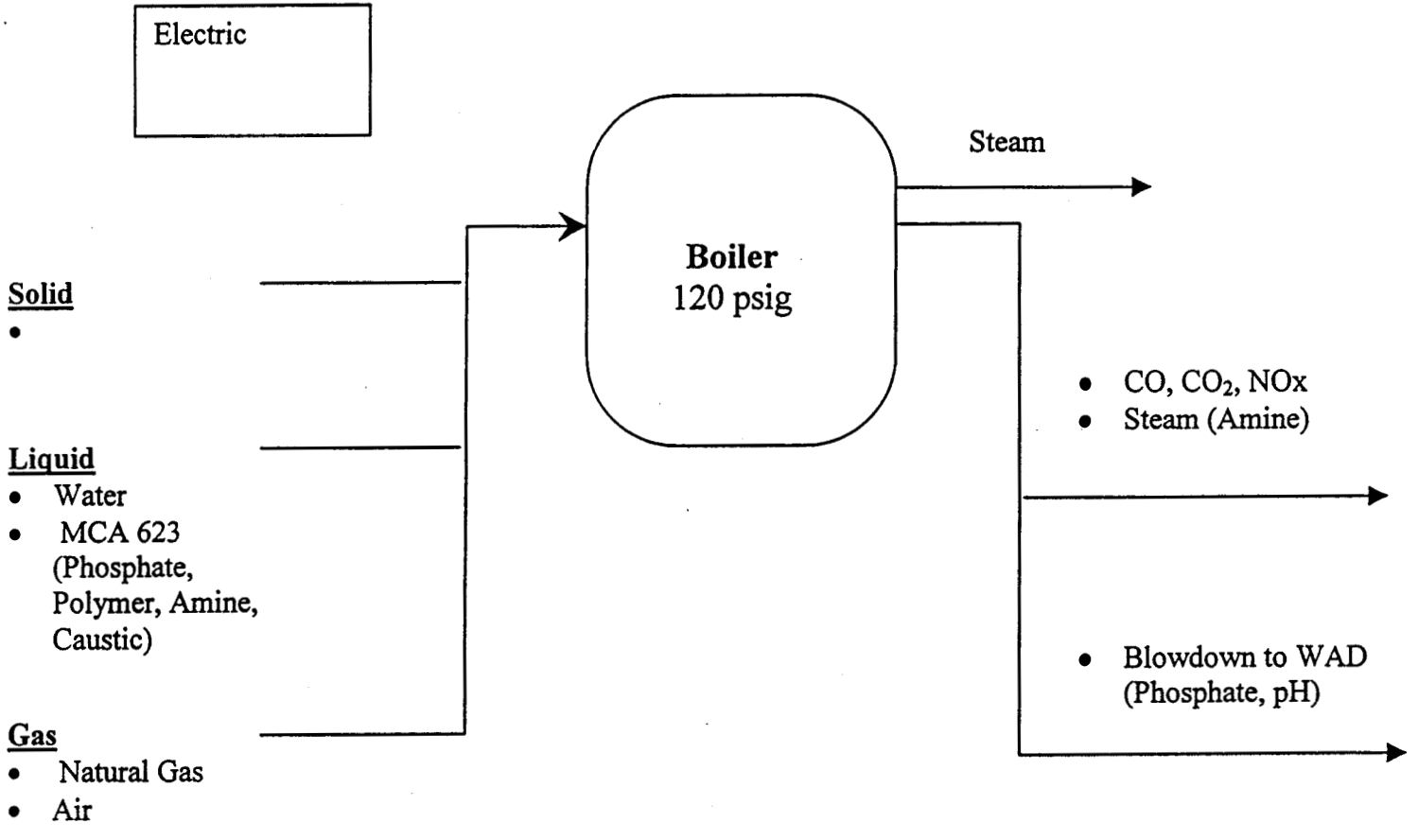
Aspects Analysis

Rejuvenation Manufacturing

	"The Natural Step" System Conditions						TNS	Frequency	Aspect	Regulated	
	Extraction	Persistency	Toxicity	Biodiversity	Efficiency	Equity	Subtotal	of Activity	Score	Yes/No	Impact
VENDOR BASE											
Primary Materials Suppliers											
Brass	5	5	2	2	5	1	15	5	20	NA	Mining/Air Quality
Glass	5	5	2	2	5	1	15	5	20	NA	Mining/Energy
Paper	3	3	1	5	3	1	13	5	18	NA	Biodiversity
Chemical Suppliers	5	5	4	3	5	1	18	5	23	Yes	Extraction/Air Quality
Plater	5	5	4	4	4	1	19	5	24	Yes	Extraction/Water Quality
Powder Coater	5	5	3	3	4	1	17	5	22	Yes	Extraction
Laundry Service	2	3	3	2	2	1	11	5	16	Yes	Water Quality
Transportation Services											
Inbound	3	5	2	3	4	1	14	5	19	Yes	Air Quality
Outbound	3	5	2	3	4	1	14	5	19	Yes	Air Quality
CUSTOMER BASE											
Incandescent Product Attribute	3	3	3	3	5	1	13	4	17	Yes	Energy/Air Quality
Packaging	3	3	2	5	2	1	14	4	18	No	Solid Waste
End-of-Life Disposition	2	5	1	3	2	1	12	3	15	No	Solid Waste
NOTE: Aspect Score = (TNS Subtotal) + (Frequency of Activity)											

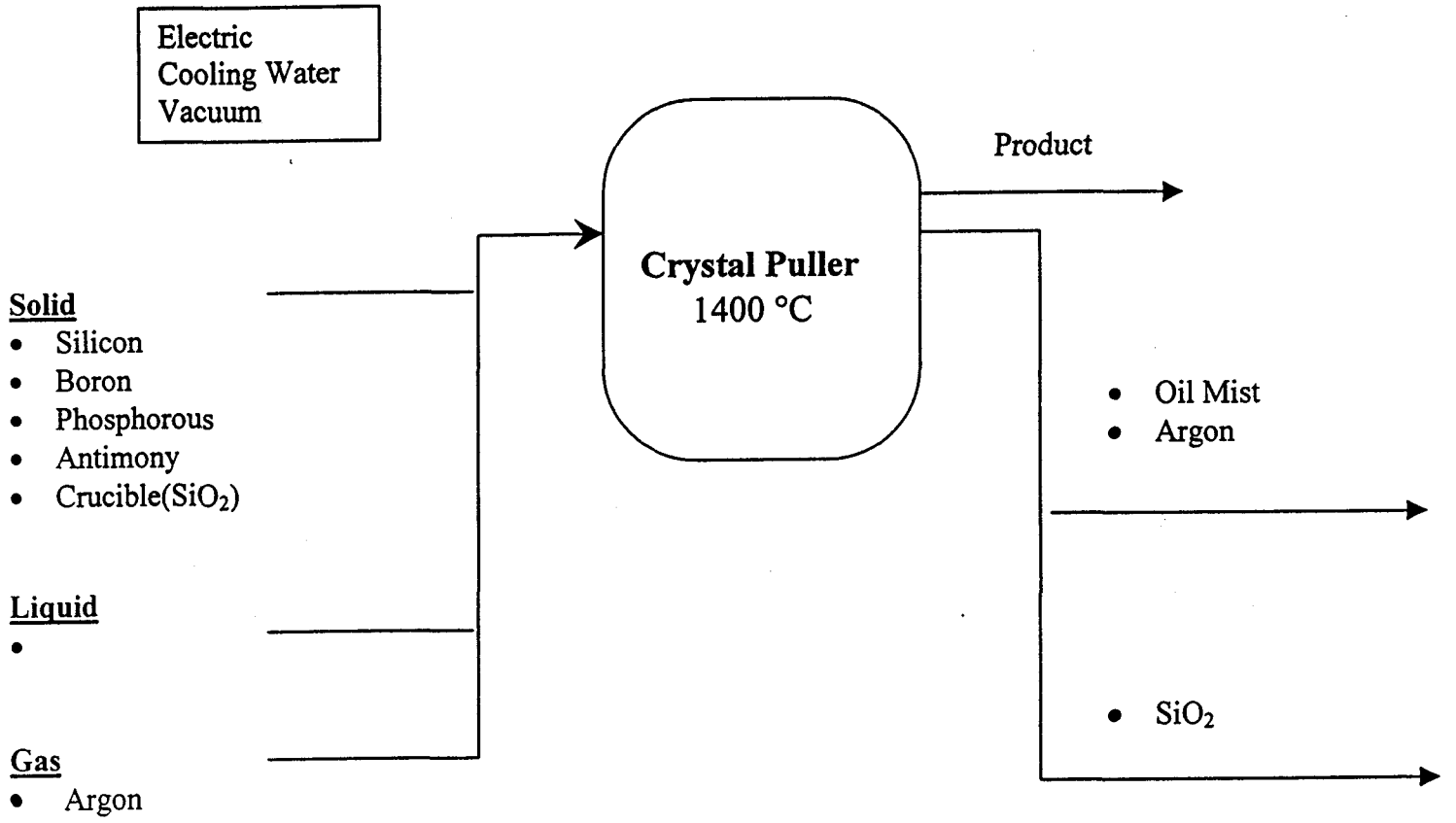
Input / Output Analysis

Facilities Boilers



Input / Output Analysis

Growing



Aspect Scoring by Process

Dept:		**Person Responsible:**	
Process:		**Cost Center:**	

Aspect	Material No	Total Qty /year	Wastestream	> 50% Reused	Likelihood of Impact: Controls	Likelihood of Impact: Freq of Use	Note
Use of Natural Resources							
Other							
☐ Electricity	1000			☐			
Liquid/Slurry							
☐ DI Water	1132			☐			
☐ Diesel (No. 2)	10001			☐			
☐ Fuel Oil	1002			☐			
☐ Kersoene (or Diesel Fuel #1)	10003			☐			
☐ Low Sulfur Diesel (No. 2)	10002			☐			
☐ Water - Cooling Loop 2	1142			☐			
☐ Water - Cooling Loop 3	1143			☐			
☐ Water - Total City (Process Water)	1004			☐			
Gas							
☐ Fossil Fuel (Natural Gas)	1001			☐			

Aspect Assessment

Dept: Site-Wide Baseline

Aspect	Material No	Total Qty		Resource Impact: Recycled/ Reused	Resource Impact: Use	Human Impact: NFPA	Likelihood of Impact: Controls	Likelihood of Impact: Freq of Use	Environmental Impact: Regulatory	Environmental Impact: Quantity Released	Environmental Impact: Physical State	Environmental Impact: Negative Image to Stake-holders	Total Score
Use of Natural Resources													
Other													
Electricity	1000	128195000	KWH	4	4	1.3			0	4	0	0	6.3
Liquid/Slurry													
DI Water	1132	263375008	Gal	4	4	0.0			0	4	3	4	6.8
Diesel (No. 2)	10001	702	Gal	4	2	1.3			4	2	3	0	6.6
Fuel Oil	1002	4225	Gal	4	3	1.3			4	3	3	0	7.3
Kersoene (or Diesel Fuel #1)	10003	678	Gal	4	2	1.3			4	2	3	0	6.6
Low Sulfur Diesel (No. 2)	10002	1133	Gal	4	3	1.3			4	3	3	0	7.3
Water - Cooling Loop 2	1142	11164000	Gal	4	4	0.0			0	4	3	4	6.8
Water - Cooling Loop 3	1143	44401000	Gal	4	4	0.0			0	4	3	4	6.8
Water - Total City (Process Water)	1004	573460992	Gal	4	4	0.0			0	4	3	4	6.8
Gas													
Compressed Air (CDA)	1146			0	0	0.0			0	0	4	0	1.0
Fossil Fuel (Natural Gas)	1001	157000000	scf	4	4	1.7			0	4	4	0	7.7

Evaluation of Significant Environmental Aspects

A. Recycled/Reused

Classification	Score
> 50% Reused	0
> 50% Recycled	2
Neither	4

B. Usage

Score for gallons:

Classification	Score
Small (< 10 gal/yr)	0
< 100 gal/yr	1
< 1,000 gal/yr	2
< 10,000 gal/yr	3
Large (> 10,000 gal/yr)	4

C. Health and Safety.

Classification	Score
All Aspects	(Health + Flammability + Reactivity)/3

D. Controls

Classification	Score
Closed System (Mechanical, closed loop, little chance of spill or release)	1
Monitored System (Controlled by equipment or has secondary containment or goes direct to drain)	2
Work Instruction (Controlled by a person & no secondary containment)	3
No Controls (i.e. use in an open container with no spill containment)	4

E. Frequency of Use

Classification	Score
Rare/Improbable (yearly)	0
Infrequent (monthly)	1
Occasional (weekly)	2
Frequent (daily)	3
Continuous	4

F. Regulatory

Classification	Score
None	0
Moderate – Contains a 313 TRI chemical	2
High – Permit parameter, VOC, Refrigerant, Hazardous Waste, Recycling requirements, Contains a 313 TRI chemical and is over threshold &/or RMP chemical in a covered process.	4

G. Quantity Released

Refers to quantity discharged or released form the Portland site.

Same as *Usage (B)*.

H. Physical State (As Released)

Classification	Score
NA	0
Solid	1
Liquid	3
Gas	4

I. Negative Image to Stakeholders

Classification	Score
Low potential	0
Moderate potential	2
High potential	4

Site-Wide Analysis

Site-Wide Score = Resource Impact + Human Impact + Environmental Impact

i.e.: Site-Wide Score = (A + B)/2 + C + (F + G + H + I)/4

Aspect & Impact Rating Worksheet

Rev. I, GE, 4/7/99
Assumptions: Under **direct** control of RA
Type of Impact: Controllable

Process/Activity: _____ Dept: _____

Date of Meeting: _____

Additional Process/Activity Notes:

Evaluators	Dept/Expertise

Normal Conditions: Routine, planned operating conditions
Abnormal Conditions: Unplanned, but reasonably foreseeable events
*** if no controls (preventive maint., 2ary contain, etc)*

		Normal Conditions		**Abnormal Conditions ****	
Vector:	Aspect(s):	Rating	Comments/Controls	Rating	Comments
Air Emissions					
Water Discharges					
Hazardous & Potentially Haz. Waste					
General Trash					
Human Aesthetics					

Rockwell Automation

Legal & Other Requirements
4.3.2

Section I

"Legal & Other Requirements" from NSF Guide

"Legal & Other Requirements" from NSF Metal Finishers Guide

"Compliance" from Colleges and Universities EMS Guide

Section II

Charleston Public Works Handling of Legal Requirements Procedure

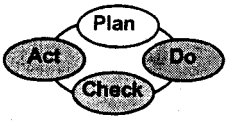
Naval Aviation Depot North Island Legal & Other Requirements Procedure

Virginia Department of Environmental Quality Legal & Other Requirements Statement

Ford Motor Company - Visteon Legal & Other Requirements

Sample Water Program Requirements Matrix

Comments:



Legal and Other Requirements

Setting the legal framework for your EMS

Legal requirements include:

- Federal requirements
- State and local requirements
- Standards in locations where you sell products/services
- Permit conditions

Other requirements might include (for example):

- Company-specific codes
- International Chamber of Commerce (ICC) Charter for Sustainable Development
- American Chemistry Council's (ACC) Responsible Care
- American Petroleum Institute's Strategies for Today's Environmental Partnership (API STEP)
- Other industry codes or programs to which your organization voluntarily subscribes.

KEY STEPS

- ☑ Identify Requirements
- ☑ Analyze Impacts
- ☑ Communicate
- ☑ Act

In order to comply with laws and regulations that apply to your organization, you must first know **what the rules are** and **how they affect** what you do. As discussed earlier, compliance with legal requirements is one of the "three 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.

Thus, an effective EMS should includes 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

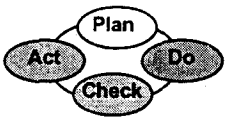
Your EMS should include a procedure for **identifying, having access to and analyzing** applicable legal and other requirements. "Other requirements" might include industry codes of practice or similar requirements to which your organization might subscribe.

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

- commercial services (with updates offered on-line, on CD-ROM or in paper form);
- regulatory agencies (federal, state and local);
- trade groups / associations;
- the Internet (see USEPA web site at *www.epa.gov*);
- public libraries;
- seminars and courses;
- newsletters / magazines;
- consultants and attorneys; and
- customers, vendors and other companies.

Small business assistance programs exist in every state. Under the Clean Air Amendments of 1990, each state environmental regulatory agency has established

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For more information on EMS and compliance, see "Improving Environmental Performance and Compliance: Ten Elements of Effective Environmental Management Systems" (see Appendix F for details)



- ***Environmental Policy***
- ***Objectives & Targets***
- ***Training & Awareness***
- ***Communication***
- ***Operational Controls***



See Appendix A for information on resources for tracking environmental laws and regulations.

technical and compliance assistance programs to help companies comply with air quality rules. In some cases, these programs have expanded into other environmental "media", such as water and waste management. In addition, National Compliance Assistance Centers can provide compliance assistance for certain industry sectors (see Appendix F for more information).

Once applicable requirements have been identified and analyzed for potential impacts, **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 impacts on the organization) is an important but often overlooked step. Keep in mind that different people may have different information needs.

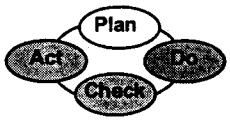
As with many EMS elements, this is **not a "one time" activity**. Since legal and other requirements change over time, your process should ensure that you are working with up-to-date information.

Resources to identify and track environmental laws and regulations are described in the **Tool Kit** (Appendix A).

Commonly Applicable Federal Environmental Laws in the US

Clean Air Act (CAA) [40 CFR Parts 50-99]	Establishes ambient and source emission standards and permit requirements for conventional and hazardous air pollutants.
Clean Water Act (CWA) [40 CFR Parts 100-145, 220-232, 410-471]	Establishes ambient and point source effluent standards and permit requirements for water pollutants, including sources that discharge directly to a waterbody or to a public sewer system.
Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) [40 CFR Parts 150-189]	Establishes a program for Federal review of, registration and control of pesticides.
Resource Conservation and Recovery Act (RCRA) [40 CFR Parts 240-299]	Establishes regulations and permit requirements for hazardous waste management. Also, creates standards for underground storage tanks that hold oil or hazardous substances.
Toxic Substances Control Act (TSCA) [40 CFR Parts 700-799]	Regulates the use, development, manufacture, distribution and disposal of chemicals. Certain chemicals (such as PCB's) are subject to specific management standards.
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, also known as "Superfund") [40 CFR Parts 300-311]	Establishes a program for cleaning up contaminated waste sites and establishes liability for clean-up costs. Also, provides reporting requirements for releases of hazardous substances
Emergency Planning and Community Right-To-Know Act (EPCRA) [40 CFR Parts 350-374]	Establishes a program (also known as the "Toxic Release Inventory") to inform the public about releases of hazardous and toxic chemicals. Reporting requirements apply to companies that use, process or store specific chemicals over specified quantities.
Hazardous Materials Transportation Act (HMTA) [49 CFR Parts 100-180]	Establishes standards for the safe transportation of hazardous materials.

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Capture the Learning: Legal & Other Requirements Worksheet

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 web sites, 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 ...	

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Resources for Tracking Environmental Laws and Regulations

Over the last few years, the Internet has emerged as a tremendous tool for tracking and obtaining information on environmental laws and regulations. For example, the USEPA home page (see address below) in one quite useful Internet source. See **Appendix F** for additional information on resources. .

This table 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 or NSF of any commercial products listed here.

Source	Description
USEPA Small Business Ombudsman (1-800-368-5888)	Regulatory explanations and guidance, research, case studies, contacts for additional information. Variety of hotlines available for particular statutes (such as RCRA). Internet access also available (http://www.epa.gov).
USEPA Web Site	Provides a variety of information of environmental laws and regulations as well as tools and compliance guidance. (http://www.epa.gov).
Small Business Assistance Programs (various states)	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 (various)	Provide a variety of services related to environmental laws and regulations, including regulatory updates and training. Contact individual associations for details.
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 on 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.

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Sample Process Tool:
Setting Objectives & Targets

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2.3 Legal and Other Requirements [ISO 4.3.2]

What the ISO Standard Requires

The ISO Standard requires organizations to have a procedure that specifies how relevant legal (and other) information is identified and how access to that information is provided. A written procedure is not required in this case.

Starting Points

Most small companies have difficulty obtaining up to date information about current environmental regulations and about proposed (or scheduled) changes to regulations. Many of them rely on the local and state inspectors (such as the local Publicly Owned Treatment Work) and on regulatory agencies to inform them about regulatory requirements. However, this situation is changing, especially within programs that involve the smaller facilities. Some examples of these programs include, for example, the storm water discharge regulations, hard chrome Maximum Achievable Control Technology (MACT) standards, and Title V – Volatile Organic Compound (VOC) regulations. Federal and State agencies have increased efforts to improve the quality and quantity of information and assistance programs available, especially to small business owners.

Also, several trade associations such as the American Electroplaters and Surface Finishers (AESF), the National Association of Metal Finishers (NAMF), and the Metal Finishers Suppliers Association (MFSA) provide regulatory updates and other specific assistance to their members. These are available in their trade publications, and in special programs and guides.

Several states (such as Pennsylvania, California, and Illinois) have developed compliance checklists for use by small businesses, and provide other "user friendly" tools and information sheets to make regulatory information much easier to understand and act on. The Internet has made much of this information readily accessible to businesses. However, unless a business continues to periodically update and screen this information—and makes an effort to see that everyone who needs to know does—it is still possible for some critically important regulatory issues to slip through the cracks.

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Implementation Tips

1) Use your current list of permitted or regulated activities as a starting point. How does your company stay current about legal requirements in these areas? Are there particular sources of information that you find valuable? Does everyone who needs to have access to this information receive it on a timely basis?

2) Consider having a compliance audit by an outside consultant. This can give you a good baseline of information from an outside perspective. If you are concerned that you may have some compliance issues, be sure to contact a good environmental lawyer who is familiar with the compliance audit policies in your state, before you schedule an audit. Many states are offering various types of regulatory flexibility for companies who want to improve their track records. Ask for recommendations on reliable sources of local and state regulatory information.

3) Contact your state environmental regulatory agency to find out what types of information are available. Other programs that may provide environmental assistance include organizations such as your local Small Business Development Center, or Manufacturing Extension Partnership or Manufacturing Technology Center. Many states have developed compliance checklists that they can send out to you as a starting point, and several have developed excellent Internet sites, periodic newsletters and special programs, training events, and conferences.

4) Formalize your regulatory review process: Include a time frame for the performance of the regulatory review (e.g., monthly, quarterly) and document that the review has been completed. One procedure stated, "If no information is found during these [regulatory] reviews, a dated written statement from the EMS Representative will serve as evidence of quarterly review."

5) List the requirements: Maintain a list of requirements, both regulatory and voluntary, that are applicable to your organization. This is not a requirement of the standard but is useful in training, as a reference for future regulatory updates, and in developing appropriate operational procedures. While most of the metal finishers did not develop a complete list their identified requirements, some did include a list of the sources for obtaining regulatory information as part of their "Legal and other requirements" procedure. See Example 2.3.1 as an example. This list provides a good mechanism for ensuring that the most current

list of sources is available. However, it must be updated when new or revised sources of regulatory information are identified.

6) Include local requirements: Companies often use commercial databases and professional organizations as sources for information. These are good resources but are often not all-inclusive. Be sure to consider local environmental requirements as part of your legal review (for example, local ordinances may include solid waste management, wetland preservation, noise control, landscape and screening, sediment and erosion control, wastewater pre-treatment, and stormwater discharge).

7) Have access to requirements: The requirement under "Legal and other requirements" to identify and provide *access* to legal and other requirements," does not mean that the requirements have to be copied and distributed to everyone. The location of the requirements should be clearly communicated to appropriate individuals and the files made readily available. In addition, if your company subscribes to a metal finishing code of practice such as the CSI Metal Finishing Strategic Goals Program, be sure that the appropriate employees have access to information about those requirements as well.

8) A good overall question to ask yourself is, " If there were a change or a proposed change in an applicable law or regulation, how would the right people in my company find out about it?"

Examples

Example 2.4.1 Sources of Legal and Other Information

Source	Item	Information Tracked
Internet	Federal Register (FR) Tracker)	Daily Updates to the FR
Internet	National Metal Finishing Resource Center (NMFRC)	Laws and Regulations, Includes State Regulations
CD-ROM	SmartCite (Bureau of National Affairs - BNA)	Applicable Laws for Each Facility
BNA Subscription	Federal Register Updates	Weekly FR Update Report
Trade Publications	AESF, NAMF	Monthly Columns on Environmental Regulations
AESF/NAMF Metal Finishing Guidance Manual	Chapters on Federal Regulations	Air, Water, Hazardous Waste, EMS,
Consultants and Attorneys	Legal Opinions	Decisions on specific situations and applicability of regulations to our operations
Small Business Assistance Programs	Newsletters, seminars	Updates on State and Local Regulations

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Conformance Check

All of the metal finishers elected to go beyond strict conformance with the ISO 14001 standard and have a written procedure to meet this requirement. Many used the sample "Regulatory Tracking and Analysis "found in *Environmental Management Systems: An Implementation Guide for Small and Medium-Sized Organizations* as their starting point. No omissions in conformance to the standard were noted.

EMS Links

- Environmental aspects: The laws and regulations you identify as pertinent to your company must be directly applicable to your environmental aspects. Metal finishers are often aware of their regulatory compliance requirements before they begin EMS development and aspect identification. If this is the case, linking each aspect you identify to a requirement serves as a double check to be sure that you have considered all the pertinent legal requirements.

- Objectives and targets: Legal and other requirements are only one consideration in setting or revising objectives. Other factors include environmental aspects, technological options, financial considerations, operational and business requirements, and the views of interested parties.

- Training, awareness, and competence: The roles and responsibilities of employees for complying with the environmental requirements (i.e., regulations plus voluntary standards or codes) of your EMS is an important part of environmental training.

- Operational control: The link between operational controls and legal and other requirements is through the environmental policy. When determining which operations/activities should have operational controls, consider your objectives, commitment to prevention of pollution, and "commitment to comply with relevant environmental regulations, and with other requirements to which the organization subscribes."

- Monitoring and measurement: The link with legal and other requirements is direct. The standard requires you have a written procedure for evaluating your compliance with environmental regulations. Companies often build on their internal environmental compliance auditing program to meet this requirement.

ELEMENT 2.2

COMPLIANCE

All EMSs must, at a minimum, address compliance with applicable environmental regulations. Because C/U activities create a diverse, often uncertain, hazardous waste stream, it is especially critical that C/U's develop and implement a structured, comprehensive approach to compliance. In March 1999, EPA New England announced its college and university initiative that includes proactive assistance tailored to the needs of C/Us as well as an aggressive enforcement presence, including unannounced inspections at university campuses. Several of the inspections have resulted in penalty actions. Since then, other EPA Regions launched similar initiatives. EPA's Office of Enforcement and Compliance Assistance (OECA) published the C/U enforcement initiatives at http://es.epa.gov/oeca/ore/enfalert/vol3num7.html. EPA's goal is to improve the environmental footprint at colleges and universities and set the same standards of private industry to ensure overall compliance. Coupled with past deficiencies and combined with the diverse, decentralized nature of campus organizational structures, may make "Compliance" the single-most important element of your EMS. Costs of noncompliance can have significant effects both on and off campus, some of which include:

- **Penalties** – depending on the extent of regulatory violations, recent fines to C/U's have ranged from $10,000 to over $1,500,000. Additionally, costly fines may affect departmental funding, potentially affecting academic performance.
- **University Reputation** – C/U's compete for talent in the form of students and faculty and funding whether governmental or private, much as any private industry, and as environmental awareness increases among prospective students, their parents, and funding organizations, poor environmental performance may negatively enrollment and funding.
- **Community Relations** – C/U's operations can impact the environmental quality of their surrounding community, and for C/Us situated in smaller cities or rural areas, C/U's are often the financial and cultural center of the community and are therefore closely identified with the image of the community. Regulatory violations by C/U's not only affect the campus, but might also affect the image of neighboring communities.

To be in compliance with the laws and regulations that apply to your C/U and its operations, you must (1) *know what the regulations are* and (2) *implement procedures and install equipment to comply with those regulations*. Changes in compliance requirements might require you to modify your environmental objectives or other elements of your EMS. By anticipating new requirements, you may be able to minimize future compliance obligations through process changes. Therefore, it's important to (1) identify and use information and assistance sources such as guidance documents and technical contacts at pertinent regulating agencies, (2) maintain contact with local and national associations and workgroups, and (3) commit to reviewing your compliance requirements at regular time intervals during the year.

COMMONLY APPLICABLE FEDERAL ENVIRONMENTAL LAWS

Law	Description
Clean Air Act (CAA) [40 CFR Parts 50-99]	Establishes ambient and source emission standards and permit requirements for conventional and hazardous air pollutants.
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, also known as "Superfund") [40 CFR Parts 300-311]	Establishes a program for cleaning up contaminated waste sites and establishes liability for cleanup costs. Also, provides reporting requirements for releases of hazardous substances.
Clean Water Act (CWA) [40 CFR Parts 100-145, 220-232, 410-471]	Establishes ambient and point source effluent standards and permit requirements for water pollutants, including sources that discharge directly to a waterbody or to a public sewer system.
Emergency Planning and Community Right-To-Know Act (EPCRA) [40 CFR Parts 350-374]	Establishes a program (also known as the "Toxic Release Inventory") to inform the public about releases of hazardous and toxic chemicals. Reporting requirements apply to companies that use, process or store specific chemicals over specified quantities.
Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) [40 CFR Parts 150-189]	Establishes a program for Federal review of, registration and control of pesticides.
Hazardous Materials Transportation Act (HMTA) [49 CFR Parts 100-180]	Establishes standards for the safe transportation of hazardous materials.
National Environmental Policy Act (NEPA) [40 CFR Part 6]	Establishes national environmental policies and goals.
Resource Conservation and Recovery Act (RCRA) [40 CFR Parts 240-299]	Establishes regulations and permit requirements for hazardous waste management. Also, creates standards for underground storage tanks that hold oil or hazardous substances.
Safe Drinking Water Act (SWDA) [40 CFR Part 141]	Sets minimum national standards for drinking water. Developed maximum contaminant levels for coliform bacteria and hazardous waste. Required that mechanisms be put in place to protect groundwater and that water supplies be periodically monitored.

Source: adapted from Environmental Management Systems: An Implementation Guide for Small and Medium-sized Organizations, NSF International, 2001

Also, as you complete the process of cataloging compliance requirements, you should begin to identify "environmental metrics" that should be addressed in *Element 4.1, Measurement and Monitoring.*

REGULATORY MATRIX OF C/U ACTIVITIES[1]

	CAA	CERCLA	CWA	EPCRA	FIFRA	HMTA	NEPA	RCRA	SWDA	TSCA
Laboratories	•		•			•		•		
Janitorial Services	•		•			•		•		
Art Studios	•		•			•		•		
Fleet Operations	•		•			•		•		•
Grounds Maintenance	•	•	•	•	•			•	•	
Power Generation	•		•	•			•	•	•	•
Water/Wastewater Treatment	•	•	•	•	•		•	•	•	•
Fuels Management	•		•			•	•	•	•	•
Solid Waste Management	•	•	•			•	•	•	•	
Hazardous Materials Management	•	•	•	•		•	•	•		
New Construction	•	•	•				•	•		
Renovation/Demolition	•		•				•	•		•
Building Maintenance	•	•	•	•	•		•	•		
Outdoor Recreation (stadiums, golf courses, etc.)	•	•	•	•	•		•	•		•
Food Services	•		•							

1 This matrix contains probable, but not comprehensive, lists of federal regulations pertinent to common C/U activities. Use the matrix as a starting point for determining your C/U's unique compliance obligations.

Implementation: *Procedure 2.2, Compliance,* describes the process for identifying and maintaining your C/U's regulatory compliance approach. Because C/Us across the country and even within the same state have widely varying compliance requirements that are often dictated at the state or local level (for example, RCRA authorized states that add additional hazardous wastes requirements), the tools included in this element focus on helping your C/U address common deficiencies with C/U compliance programs. The tools are described below:

Regulatory compliance requirements include:

- Federal requirements
- State and local requirements
- Permit conditions

Other environmental "requirements" might include:

- C/U-specific procedures and standards
- Standards in the community or neighborhood your C/U is located
- International Chamber of Commerce (ICC) Charter for Sustainable Development
- Other C/U association codes or programs to which your C/U voluntarily subscribes

Compliance Calendar (see page 2.2-5). The compliance calendar is a blank form for organizing compliance requirements according to the frequency of completing reporting requirements. Your C/U can use the compliance calendar to manage your resources and scheduling to anticipate the reporting obligations you have on daily, weekly, monthly, or annual basis, or on a specific date.

Common Deficiencies with C/U Compliance Programs (see page 2.2-9). These tools summarize areas in which EPA often discovers insufficient documentation or compliance with regulations; there are tools for the Resource Conservation Recovery Act (RCRA), Spill Prevention, Controls and Countermeasure (SPCC) Plans, underground storage tanks (UST), and the Clean Air Act (CAA).

In addition, several guides for Common Compliance Documentation issues are available at http://www.epa.gov/region01/steward/univ/index.html in case your C/U has no similar form already developed, or if the existing form needs improvement.

SAMPLE PROCEDURE ONLY – REVISE AS NEEDED

[C/U Name]	EMS Procedure	2.2
	Effective Date	
	Subject	Compliance

Purpose This procedure is used to (1) identify weaknesses in the [C/U Name] current compliance status and performance, and (2) help the [C/U Name] become informed about and track compliance requirements.

Step 1 The EMS Manager will complete a structured regulatory compliance review of the [C/U Name] operations. The EMS Manager will select other EMS Participants and outside parties as appropriate to assist in the review. Generally, the compliance review will initially occur as a paper exercise conducted in the office and migrate to physical inspections and document review with individuals able to confirm and document the presence of appropriate compliance programs.

Step 2 After completing the compliance review, the EMS manager will prepare a list of potential objectives and targets related to compliance requirements or performance. The list will be used in completing Element 2.3, Objectives and Targets.

Step 3 The EMS manager will reference the results of the compliance review during day-to-day operations to assist in planning for and meeting the [C/U Name] compliance requirements.

Step 4 The EMS manager will stay informed of changing environmental regulations by (check those that apply):

- ☐ Reviewing regulatory updates and its [C/U Name] compliance calendar
- ☐ Attending compliance workshops offered by federal, state, and local regulatory agencies and [C/U Name] sector associations.
- ☐ Using a consultant specializing in compliance issues
- ☐ Visiting Internet websites with compliance assistance content
- ☐ Other

Step 5 The environmental manager or designee will complete a compliance review at least every 6 months to identify new and existing weakness, and in response to new or changed environmental regulations.

EMS Compliance Calendar

DAILY

Agency	Program	Program/ Question	Scheduled Task

WEEKLY

Agency	Program	Program/ Question	Scheduled Task

MONTHLY

Agency	Program	Program/ Question	Scheduled Task

QUARTERLY

Agency	Program	Program/ Question	Scheduled Task

EMS Compliance Calendar

ANNUALLY

Agency	Program	Program/ Question	Scheduled Task

PERIODICALLY

Date	Agency	Program	Program/ Question	Scheduled Task

EMS Compliance Calendar (Example)

Compliance Calendar

DAILY

Agency	Program	Scheduled Task
OSHA	Injury & Illness Prevention Program	Safety Suggestion Box – check for new suggestions
State/Local	On-Site Hazardous Waste Management	Facility Inspection – check hazardous waste storage areas for proper containers and labeling, storage conditions, etc.

WEEKLY

Agency	Program	Scheduled Task
State/Local	On-site Hazardous Waste Management	Facility Inspection -- check containment, stored containers, and tanks

MONTHLY

Agency	Program	Scheduled Task
OSHA	Injury & Illness Prevention Program	Employee Training – conduct monthly safety meeting
OSHA	Injury & Illness Prevention Program	Safety Committee – conduct monthly safety committee meeting
State/Local	Storm Water Pollution Prevention	Facility Inspection – conduct storm water discharge visual observation – check for presence of floating and suspended material, oil and grease, discoloration, turbidity, odor, and pollutants
POTW	Industrial Wastewater Discharge	Periodic Sampling
State/Local	Fuel Storage and Management	Tank, dispensing equipment inspections

QUARTERLY

Agency	Program	Scheduled Task
State/Local	Storm Water Pollution Prevention	Facility Inspection – conduct non-storm water discharge visual observation – check for flow, debris, odor, and discoloration
POTW	Industrial Wastewater Discharge	Periodic Report of Continued Compliance – submit quarterly discharge monitoring report to local sewer agency.

EMS Compliance Calendar (Example)

ANNUALLY

Agency	Program	Scheduled Task
POTW	Industrial Wastewater Discharge	Industrial Discharge Permit – submit annual update (Note: update schedule may differ)
State/Local	On-site Hazardous Waste Management	Facility Inspection – check storage tank system
State/Local	Hazardous Materials	Submit annual update of Hazardous Materials Plan to local or state agency.
OSHA	Laboratory Ventilation	Test laboratory hoods for proper ventilation velocities
OSHA	Recordkeeping	Annual notice to employees of existence, location, and availability of employee exposure and medical records
USEPA State/Local	Employee Training	Emergency Coordinator Training – annual refresher training
USEPA	RCRA	Annual Refresher Training
	TRI	Annual Toxic Release Inventory Reporting

PERIODICALLY

Date	Agency	Program	Scheduled Task
March 1 of Even Number Years	USEPA State/Local	On-site Hazardous Waste Management	Biennial Report – submit completed report on agency forms, if required
June 1	State/Local	Storm Water Pollution Prevention	Facility Inspection & Plan Review – conduct annual inspection of storm water structures and evaluation of SWPP Plan
Every 3 years	USEPA/ State	SPCC	SPCC Recertification and updating
Every 90 days	USEPA/ State/Local	Hazardous Waste Management	Dispose of any hazardous waste before 90-day limit

Common Deficiencies with C/U Compliance Programs

INSTRUCTIONS: Included in this tool, are lists of common deficiencies EPA encounters in enforcing federal regulations. The list includes only the most common violations and is intended to spur review of your C/U's status and not act as a comprehensive checklist; there are lists for:

Regulation	Description
RCRA	✓ Failure to appropriately label and mark satellite accumulation containers. ✓ Failure to clearly mark and date the period of accumulation for each accumulation container. ✓ Failure to provide and document initial hazardous waste training. ✓ Failure to separate or protect containers of hazardous waste from other containers storing incompatible materials or wastes. ✓ Failure to make hazardous waste determinations. ✓ Failure to accumulate hazardous waste in a closed container except when adding or removing waste. ✓ Failure to obtain a permit when storing hazardous wastes for greater than 90 days. ✓ Failure to inspect hazardous waste containers, specifically failure to inspect on a weekly basis. ✓ Failure to have an adequate Contingency Plan for new operations. ✓ Failure to provide secondary containment around hazardous waste container storage areas in an area with a functional floor drain. ✓ Failure to maintain and operate the facility in a manner to minimize the possibility any planned or unplanned release of hazardous constituents to air, soil, or surface water which could threaten human health or the environment. ✓ Failure to maintain adequate aisle space to allow the unobstructed movement of personnel or emergency equipment in the container storage areas.
SPCC	✓ No plan at all. ✓ Failure to prepare and implement SPCC plan, specifically failed to include all elements of a complete plan as required by SPCC regulations. ✓ Plan not PE certified. ✓ Plan not reviewed/updated every three years. ✓ Plan does not include all oil on facility, i.e., transformers, hydraulic systems, emergency generators, drum storage, etc. ✓ Plan does not accurately identify, from each oil storage location, the detailed path spilled oil would take to reach a waterway, i.e., a typical campus is so wide, drainage may flow in different directions, to different receptors, especially in urban locations. Drains not traced out. ✓ EH&S staff do not conduct regular walk-through inspections of teaching and research locations to be aware of oil use by professors, TAs, graduate students, and other non-maintenance staff. ✓ Small, scattered Aboveground Storage Tanks (ASTs), especially in dormitory locations, are not adequately protected from tampering/vandalism. A transient student population presents unique hazards not encountered with supervised adults in an industrial setting. Students are not employees, are not OSHA trained, and have no stake in paycheck protection through preservation of an employer's image or goodwill.

Common Deficiencies with C/U Compliance Programs

CAA	✓ Failure to submit appropriate reports. ✓ Failure to monitor fuel for nitrogen and sulfur content. ✓ Failure to obtain minor permits. ✓ Failure to install or failure to maintain in good working order opacity monitors. ✓ Exceeding annual or 12 month rolling cap for fuel or steam production. ✓ Failure to provide and document actual annual VOC emission calculations for solvent degreasers. Also involves records of solvent additions and deletions from degreaser. ✓ If there is a gasoline pump on site: ▪ Failure to keep monthly throughput records. ▪ Failure to install/test vapor recovery system; and ▪ Failure to keep records of maintenance and malfunctions of vapor recovery systems. ✓ If there is a paint booth, use of paint booth coatings that exceeded allowable limits of VOC contents. ✓ Failure to obtain permits and keep records of operating hours for emergency generators.
UST	✓ Leak detection system not working properly for a gasoline tank. ✓ Several tanks have no leak detection system. ✓ Incomplete tank removal – the hole was left in ground along with the contaminated soil on site.

Don't forget these important laws in North Carolina!

§ 130A-309.10. Prohibited acts relating to packaging; coded labeling of plastic containers required; disposal of certain solid wastes in landfills or by incineration prohibited.

(a) No beverage shall be sold or offered for sale within the State in a beverage container designed and constructed so that the container is opened by detaching a metal ring or tab.

(b) No person shall distribute, sell, or offer for sale in this State, any product packaged in a container or packing material manufactured with fully halogenated chlorofluorocarbons (CFC). Producers of containers or packing material manufactured with chlorofluorocarbons (CFC) are urged to introduce alternative packaging materials that are environmentally compatible.

(c) (1) No plastic bag shall be provided at any retail outlet to any retail customer to use for the purpose of carrying items purchased by that customer unless the bag is composed of material that is recyclable.

(2) It is the goal of the State that at least twenty-five percent (25%) of the plastic bags provided at retail outlets in the State to retail customers for carrying items purchased by the customer be recycled.

(d) (1) No person shall distribute, sell, or offer for sale in this State any polystyrene foam product that is to be used in conjunction with food for human consumption unless the product is composed of material that is recyclable.

(2) Repealed by Session Laws 1995, c. 321, s. 1.

(e) No person shall distribute, sell, or offer for sale in this State any rigid plastic container, including a plastic beverage container unless the container has a molded label indicating the plastic resin used to produce the container. The code shall consist of a number placed within three triangulated arrows and letters placed below the triangulated arrows. The three arrows shall form an equilateral triangle with the common point of each line forming each angle of the triangle at the midpoint of each arrow and rounded with a short radius. The arrowhead of each arrow shall be at the midpoint of each side of the triangle with a short gap separating the arrowhead from the base of the adjacent arrow. The triangle formed by the three arrows curved at their midpoints shall depict a clockwise path around the code number. The label shall appear on or near the bottom of the container and be clearly visible. A container having a capacity of less than eight fluid ounces or more than five gallons is exempt from the requirements of this subsection. The numbers and letters shall be as follows:

(1) For polyethylene terephthalate, the letters "PETE" and the number 1.

(2) For high density polyethylene, the letters "HDPE" and the number 2.

(3) For vinyl, the letter "V" and the number 3.

(4) For low density polyethylene, the letters "LDPE" and the number 4.

(5) For polypropylene, the letters "PP" and the number 5.
(6) For polystyrene, the letters "PS" and the number 6.
(7) For any other, the letters "OTHER" and the number 7.

(f) No person shall knowingly dispose of the following solid wastes in landfills:
(1) Repealed by Session Laws 1991, c. 375, s. 1.
(2) Used oil.
(3) Yard trash, except in landfills approved for the disposal of yard trash under rules adopted by the Commission. Yard trash that is source separated from solid waste may be accepted at a solid waste disposal area where the area provides and maintains separate yard trash composting facilities.
(4) White goods.
(5) Antifreeze (ethylene glycol).
(6) Aluminum cans.
(7) Whole scrap tires, as provided in G.S. 130A-309.58(b). The prohibition against landfilling whole tires applies to all whole pneumatic rubber coverings, but does not apply to whole solid rubber coverings.
(8) Lead-acid batteries, as provided in G.S. 130A-309.70.

(f1) No person shall knowingly dispose of the following solid wastes by incineration in an incinerator for which a permit is required under this Article:
(1) Antifreeze (ethylene glycol) used solely in motor vehicles.
(2) Aluminum cans.
(3) Repealed by Session Laws 1995 (Regular Session, 1996), c. 594, s. 17.
(4) White goods.
(5) Lead-acid batteries, as provided in G.S. 130A-309.70.

(f2) Subsection (f1) of this section shall not apply to solid waste incinerated in an incinerator solely owned and operated by the generator of the solid waste. Subsection (f1) of this section shall not apply to antifreeze (ethylene glycol) that cannot be recycled or reclaimed to make it usable as antifreeze in a motor vehicle.

(g) Repealed by Session Laws 1995 (Regular Session, 1996), c. 594, s. 17.

(h) The accidental or occasional disposal of small amounts of prohibited solid waste by landfill or incineration shall not be construed as a violation of subsection (f) or (f1) of this section. (1989, c. 784, s. 2; 1991, c. 23, s. 1; c. 375, s. 1; 1991 (Reg. Sess., 1992), c. 932, ss. 1, 2; 1993, c. 290, s. 1; 1995, c. 321, s. 1; c. 504, s. 9; 1995 (Reg. Sess., 1996), c. 594, s. 17.)

Also, view
http://www.p2pays.org/search/pdfframe.asp?pdfurl=/ref/01/00249.pdf

CPW ENVIRONMENTAL MANAGEMENT SYSTEM PROCEDURE

The on-line version and secured hardcopy are the controlled documents. The secured hardcopy will be identified by an "Official Document" stamp giving date of distribution. Any and all other documents are uncontrolled. Contact the EMS Program Manager for revision level status.

Effective Date:	**October 1, 2000**	**Page 1 of 3**
Revision: 2	**Identification Number: EMS – 4.3.2**	
Title:	**Handling of Legal Requirements Procedure**	
Prepared By:	**EMS Procedures Subcommittee**	
Reviewed By:	**EMS Management Steering Committee**	
Approved By:	**William E. Koopman, Jr., General Manager** **John Cook PE, Assistant General Manager**	
Date Approved:	**August 25, 2000**	

0.0 Requirement **ISO 14001; Sub Clause 4.3.2**

1.0 Purpose

This document describes the procedure to be followed for accessing and tracking regulatory and other legal requirements.

2.0 Scope

This procedure is used to facilitate tracking of legal requirements and to assist departments in the maintenance of regulatory compliance applicable to ISO 14001 Environmental Management System activities, products, or services.

3.0 Responsibility & Authority

3.1 Sections heads and departments heads are responsible to identify and analyze environmental regulations and other legal requirements relevant to their activities, products or services and communicating this information to the associates within their section or department.

3.2 It is responsibility of all associates to comply with the regulations.

4.0 Procedure

4.1 Determination of the Type of Regulatory Requirement to be Identified
Each department shall identify the relevant environmental laws, regulations and industry standards CPW adheres to. This may include international, federal, state, regional and local regulations. Types of regulatory requirements to be identified include environmental legislation that covers the protection of air, water, land, natural resources and humans.

4.2 Impacts
A listing of major areas of the environment impacted by the department operation; that is, air, water, soil, flora, fauna, and human (such as Risk Management) will be made. The list will also include major types of wastes or products that the operation generates or utilizes such as domestic waste, chemical waste, waste oils, hazardous waste, paper, metals, glass, and so forth.

4.3 Agency Lists
A check of agency lists will be made. If the departmental operation impacts a component of the environment or generates waste, the corresponding agency should be consulted for regulatory requirements that may apply.

4.4 Regulatory Services
A regulatory service, library, or regulatory contact (such as South Carolina Department of Health and Environmental Control) will be made to get a copy of relevant environmental regulations. All levels of government will be checked to see if there are regulatory requirements impacting departmental operations.

4.5 New Project or Change to Existing Operation
Each department shall review environmental requirements prior to the initiation of a new project or modification of an existing operation. The department head will check and coordinate with Design and Construction to ensure applicable city and county codes are identified and met.

4.6 Consulting Engineers and Contractors working on site shall be made aware of this procedure to ensure regulatory requirements are identified and met.

4.7 Organization and Tracking
A listing of regulatory summary sheets, or the regulations themselves, shall be maintained, by paper file or electronically, and updated as necessary.

4.8 Each department shall maintain a listing of regulatory requirements, including detailed summary sheets, or the regulations themselves. This listing may be maintained, by paper file or electronically or both and updated as necessary and at least annually. Regulatory listings or summaries should be posted electronically or made easily accessible to other departments.

5.0 Related Documentation

5.1 Regulations
5.2 Laws and Acts
5.3 Regulatory Self Assessment Reports
5.4 Permits and Permit Applications

Naval Aviation Depot, C

ISO 14001 Procedure

Title	Document Effectivity	Status
Legal and Other Requirements	First Issue Date 01/22/1999 Revision Date 04/09/1999	Issued
EMS Procedure No	**EMSMR**	Rev
EMSP432	Melito M Barrera/NI/NADEP	1

Purpose

To identify and access legal and other requirements applicable to the EMS.

Scope

This procedure covers Federal, State, and Local environmental legal requirements and other Department of the Navy corporate environmental goals and requirements to which NADEP subscribes. The OU will take these requirements into account when assessing its EAs, objectives, and targets, as discussed in EMSP 431 and EMSP 433.

Responsible Party	Responsibilities
EPO	• Maintains current information on regulatory and legal changes in the environmental field. • Ensures that environmental legal and other requirements applicable to the EMS are identified and accessible. • Assists as needed, or at the direction of the EMS MR, in the review of EAs.
EMS MR	• Coordinates the review of EAs once each EMS cycle (see EMSP 46) in order to identify the legal and other requirements brought on by changes in workload. • Identifies and accesses other environmental requirements.
OUMR	• Ensures that EAs are reviewed and updated.
NAVOSH	• Identifies and accesses safety and health legal and other requirements associated with emergency response programs.

PROCEDURE

1. **The EPO will:**

a. Subscribe to Federal, State and Local environmental regulatory information services.

b. Serve as point-of-contact for current information on changes in other organizational requirements in the environmental field.

c. Review, at least annually, all shop operations to assess changes in conditions or workload that may incur new legal or other

requirements.

d. Review environmental regulatory information at least annually or when regulations or other requirements change to determine how these changes affect shop operations.

e. Maintain environmental ER&P documents (see EMSP 447) in such a way as to ensure that the correct documents can be efficiently accessed and retrieved during emergencies (see EMSP 445).

f. When requested by the OUMR or the EMS MR, provide assistance in determining those EAs that have legal or other requirements associated with them (see EMSP 431).

g. Receive identified training to maintain knowledge of Federal, State, and Local environmental regulatory requirements (see EMSP 442).

2. The NAVOSH will:

a. Maintain subscriptions to Federal, State, and Local regulation information services in order to identify legal environmental ER&P requirements.

b. Review environmental ER&P documents to ensure that safety and health legal and other requirements are addressed (see EMSP 447).

3. The OUMR and the EPO will:

a. Review the EAs to identify changes in legal and other requirements and changes in workload, and updates the EAs to reflect these changes at least once every EMS cycle.

4. The EMS MR will:

a. Ensure that requirements resulting from management review (see EMSP 46) are incorporated into the EMS and objectives and targets.

5. General Guidance:

a. Where appropriate, new compliance projects determined by the process of identifying new environmental legal and other requirements, will be identified as SEA improvement projects (see EMSP 431).

References

ISO 14001:1996; Section 4.3.2

EMSP 431 Environmental Aspects

EMSP 433 Objectives and Targets

EMSP 442 Training, Awareness, and Competence

EMSP 445 Document Control

EMSP 447 Emergency Response and Preparedness

EMSP 46 Management Review

Document Edited By:
Form Rev 1.0.2 15 APR 2000

- *A direct link to DEQ's strategic planning and budgeting process;*
- *Appropriate procedures and training; and*
- *Performance measures, self-assessment, and independent assurance reviews.*

Dennis H. Treacy, Director
Virginia Department of Environmental Quality

This Environmental Policy shall be communicated to all employees by the EMS Manager and maintained on DEQ's website by the Public Affairs Manager.

2. Environmental Aspects, Objectives and Targets, and Environmental Management Programs

2.1. Environmental Aspects

Each year, in the month of February, the EMS Program Team (see Structure and Responsibility, §4) shall 1) develop an inventory of DEQ's environmental aspects and impacts, 2) determine which aspects are potentially significant impacts and 3) use this information in establishing environmental objectives and targets for the upcoming fiscal year.

The results of exercising this procedure shall be maintained by the EMS Manager in a document that records the findings of the EMS Program Team, the environmental objectives and targets, the management programs and plans for achieving them, and progress toward achieving environmental objectives and targets.

2.2. Objectives and Targets

Concurrent with its determination in February of each year as to which of DEQ's environmental aspects are potentially significant environmental impacts, the EMS Program Team shall establish environmental objectives and targets for the upcoming fiscal year. These Environmental Objectives and Targets shall be documented and maintained by the EMS Manager.

2.3. Environmental Management Programs

Concurrent with its determination in February of each year as to which of DEQ's environmental aspects are potentially significant environmental impacts and its establishment of Environmental Objectives and Targets, the EMS Program Team shall establish management plans and programs to achieve the environmental objectives and targets for the upcoming fiscal year. These management plans and programs shall include designation of person(s) responsible for their achievement, means and methods of achievement, and timeframes for achievement. These Management Plans and Programs shall be documented and maintained by the EMS Manager.

3. Legal and Other Requirements

In line with DEQ's Environmental Policy commitment to complying *"with all applicable environmental laws and regulations,"* the Director shall require the Director of Administration and each of the Regional Directors to compile archives of relevant environmental laws,

regulations, ordinances, and other requirements[1] applicable to the people, activities, and facilities under their control and forward them to the Manager of Legislative Affairs in the Division of Policy and Legislation.

The Manager of Legislative Affairs shall maintain this archive of relevant environmental laws, regulations, ordinances, and other requirements in accordance with the Documentation, Document Control, and Records requirements of this manual.

The Manager of Legislative Affairs shall continually monitor and review selected sources of information for new legislation proposed in the Congress of the United States and the Virginia Legislature, and for new regulations and changes proposed by the U.S. Environmental Protection Agency, the Virginia DEQ, and other federal and state agencies, applicable to the people, activities, and facilities of the DEQ, and shall forward such information to the Director of Administration and the Regional Directors, as appropriate.

The Regional Directors shall continually monitor and review selected sources of information for new environmental ordinances and changes proposed by the municipalities within their regions and shall forward such information to the Manager of Legislative Affairs.

The Environmental Manager shall periodically monitor and review identified other requirements to determine their ongoing consistency with DEQ's Environmental Policy and shall apprise the Director of Administration and/or Regional Directors of any new requirements or conflicts brought about by changes in other requirements.

The Director of Administration and each of the Regional Directors, shall at least annually

- Determine which laws, regulations, ordinances, and other requirements their area of DEQ is *prima facie* in compliance with;
- Determine which laws, regulations and other requirements their area of DEQ is *prima facie* not in compliance with; and
- Establish management plans to achieve full compliance.

These management plans shall be submitted to the Chief Deputy who shall ensure that they are effectively carried out.

4. Structure and Responsibility

The EMS Program Team, a permanent program team with members appointed by the Director of Administration and the Regional Managers and with at least three representatives from the Executive Management Team (EMT), shall be responsible for establishing and maintaining the EMS and ensuring its conformance with ISO 14001 and DEQ's E^3 Program.

[1] Other requirements are those charters, principles, guidelines, codes of conduct, or by-laws of organizations that DEQ supports or is affiliated with in any way as well as the requirements imposed by federal grants.

Ford Motor Company-Visteon
Indianapolis Plant

LIST OF RELEVANT LEGISLATIVE PERMITS AND OTHER REQUIREMENTS:

PERMITS:

Indiana Department of Environmental Management
Office of Water Management

- **Stormwater General Certificate of Coverage INR - 00F082**

City of Indianapolis Department of Public Works
Water and Land Protection Division

- **Wastewater Discharge Permit No. 371405**

Environmental Resources Management Division
Air Pollution Control

Federally Enforceable State Operating Permit (FESOP) FO97-6964-00021

LEGISLATION AND REGULATIONS:

REGULATION	SECTION CITATION	TITLE
Protection of Environment 40 Code of Federal Regulations:	Parts 50-61: Part 68 Part 112: Part 70 Part 761 Part 61 Part 82	Air Quality Risk Management & Planning Spill, Pollution Control & Countermeasure Air Quality PCB Management Asbestos Management Stratospheric Ozone Protection
Clean Water Act (CWA*)	Part 122: Parts 261-265: Part 268: Part 279:	Water Discharge Permits Hazardous Waste (RCRA*) Land Disposal Restrictions Standards for the Management of Used Oil
Oil (RCRA*)	Part 302:	Hazardous Substances and Reportable
Quantities (CERCLA*)	Part 355:	Emergency Planning and Notification
PCB's (TSCA*)	Part 761	PCB Management
(SARA*, Title III, PPA*)	Part 370:	Hazardous Chemical Reporting
Community Right-To-Know	Part 372 Part 763:	(SARA*, Title III) Toxic Chemical Release Report: (SARA*), Title III) Asbestos (TSCA*)
Transportation 49 Code of Federal Regulations:	Parts 171-172	Hazardous Material Regulations
Labor 29 Code of Federal Regulations:	Part 1910.120 Part 1910.1200	Hazardous Waste Operations & Emergency Response Hazard Communication Standard

Indiana Department of Environmental Management

Title 326	Air Pollution Control Board
Title 327	Water Pollution Control Board
Title 328	Underground Storage Tank
Title 329	Solid Waste Management Board (Chapter 28)

Indianapolis Water & Sewerage Ordinance (Chapter 671)
Indianapolis Air Pollution Control Board Regulations
Indiana Administration Code

*	CWA:	Clean Water Act
	RCRA:	Resource Conservation & Recovery Act
	CERCLA:	Comprehensive Environmental Response, Compensation, and Liability Act
	SARA:	Superfund Amendment and Reauthorization Act
	TSCA:	Toxic Substances Control Act
	PPA:	Pollution Prevention Act

OTHER REQUIREMENTS:

Ford Corporate Manufacturing Business Plan, Environmental Portion containing Corporate Citizenship

Ford Corporate Environmental Policy Letter 17

Ford Directive 120 for Environmental Strategy, Planning and Implementation

Ford Directive A-119 for Chlorofluorocarbon phaseout Program

Ford Directive D-109 for a Waste Minimization Program

Ford Directive D-101 for Energy Planning and Control

Water Program Requirements Matrix

Process Description	Control Point	OC	MM	Schedule	Responsibility	Record or Report	Reference Standard
Stormwater Permit No. TNR051983	Monthly Inspections per Section 4.4 of SWPPP	X		Monthly	Environmental Coordinator	Table 4.3 of SWPPP	TNR051983
	Quarterly Visual Monitoring per Section 5.0 of SWPPP	X		Quarterly	Environmental Coordinator	Table 5.1 of SWPPP	TNR051983
	Quarterly Storm Water Sampling and Analyses per Section 5.0 of SWPPP	X	X	Quarterly	Environmental Coordinator	Outside Lab Report	TNR051983
	Annual Comprehensive Site Evaluation per Section 7.1 of SWPPP	X		Annually	Environmental Coordinator	Table 7.1 of SWPPP	TNR051983
	DMR Submittals by 3/31/99 and 3/31/2001 per Section 6.4 of SWPPP	X			Environmental Coordinator	DMRs	TNR051983
	SWPPP Update and Certification per Section 7.2 of SWPPP	X		At least Annually	Environmental Coordinator	SWPPP	TNR051983
	Modify SWPPP within 14 days of Knowledge of Release per Section 4.3 of SWPPP	X		As Needed	Environmental Coordinator	SWPPP	TNR051983
	SWPPP Annual Training per Section 4.5 of SWPPP	X		Annually	Environmental Coordinator	Training Records	TNR051983
	Maintain Records per Section 4.6 of SWPPP	X		N/A	Environmental Coordinator		TNR051983

3 z o x 8 d PDF

Objectives & Targets

4.3.3

Section I

"Objectives & Targets" from NSF Guide

"Setting Targets and Measuring Success" from EPA IEMS Guide

"Setting Objectives & Targets" from NSF Metal Finishers Guide

"Objectives & Targets" from Colleges and Universities EMS Guide

"Set Environmental Objectives and Targets..." from First Environmental

Section II

Charleston Public Works Procedures for the Identification & Achievement of Environmental Objectives & Targets

Naval Aviation Depot Objectives & Targets Procedure

City of Seattle Environmental Indicators & Targets

Virginia Department of Environmental Quality Objectives & Targets Statement

Sample EMS Procedure: Setting and Tracking of Environmental Objectives & Targets

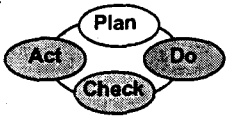
NASA White Sands Test Facility Sample Objectives & Targets

USPS Vehicle Maintenance Facility Sample Objectives & Targets

City of Scottsdale Sample Environmental Objectives & Targets

KY P2 Sample Objectives and Targets

Comments:



Objectives and Targets

Establishing goals for environmental management

Objectives and targets help an organization **translate purpose into action.** These environmental goals should be factored into your strategic plans. This can facilitate the integration of environmental management with your organization's other management processes.

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 three "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.**

Environmental Objective:

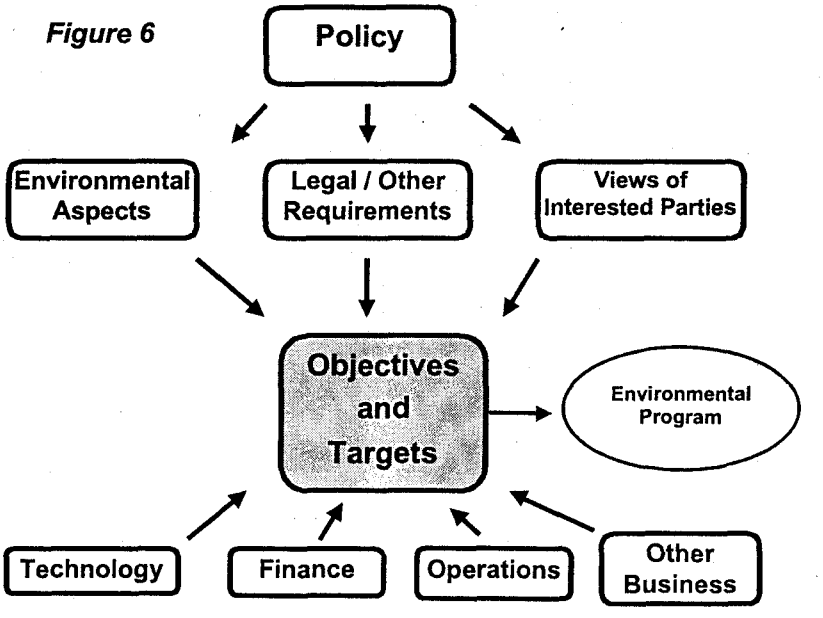
"Overall environmental goal, arising from the environmental policy, that an organization sets itself to achieve, and which is quantified where practicable."

ISO 14001

Environmental Target:

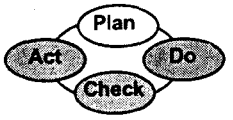
"Detailed performance requirement, quantified where practicable, applicable to the organization or parts thereof, that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives?

Figure 6



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.

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Factors to consider in setting objectives and targets

- ☑ *ability to control*
- ☑ *ability to track / measure*
- ☑ *cost to track / measure*
- ☑ *progress reporting*
- ☑ *links to policy commitments*



A sample process tool and procedure for setting objectives and targets are included in the Tool Kit (Appendix A).

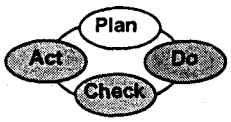


- ***Environmental Policy***
- ***Environmental Aspects***
- ***Legal & Other Requirements***
- ***Structure & Responsibility***
- ***Operational Control***
- ***Monitoring & Measurement***
- ***Management Review***

Hints:

- 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.
- How many objectives and targets should an organization have? Various EMS implementation projects for small and medium-sized organizations indicate that it is best to start with a limited number of objectives (say, 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).

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Comparing Objectives and Targets - Some Examples

Objectives	Targets
Reduce energy usage	• Reduce electricity use by 10% in 2001 • Reduce natural gas use by 15% in 2001
Reduce usage of hazardous chemicals	• Eliminate use of CFCs by 2002 • Reduce use of high-VOC paints by 25%
Improve employee awareness of environmental issues	• Hold monthly awareness training courses • Train 100% of employees by end of year
Improve compliance with wastewater discharge permit limits	• Zero permit limit violations by the end of 2001

☆☆ *POLLUTION PREVENTION* ☆☆

Pfizer Global Research & Development (formerly Warner-Lambert Parke-Davis) has a pollution prevention program that shows that improving the environment and the bottom line can go hand-in-hand. For example:

- By replacing chillers and redesigning chilling systems to be more efficient, the company has realized $250,000 in energy savings. Also, because the company is more energy efficient, it has reduced emissions from its local power supplier.
- By redesigning and modifying its dust collection system, the company replaced its 100-hp motors with 40 hp motors, without compromising the effectiveness of the dust collection system. This project lowered the company's operating costs and reduced emissions at the local power plant.

☆☆ *POLLUTION PREVENTION* ☆☆

Some Motorola manufacturing sites have reduced their water consumption and wastewater discharges by greater than 95% by installing ion exchange technology and employing better operating techniques. These changes have lowered usage of water treatment chemicals and have resulted in considerable cost savings.

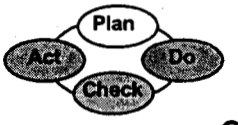
EPA's Performance Track program requires organizations to consider the following factors in setting *measurable* objectives and targets:

- **Prevention of noncompliance,**
- **Prevention of pollution at the source**
- **Minimization of cross-media pollutant transfers, and**
- **Environmental performance improvement.**

Participating organizations also must show *continued improvement* in specific environmental categories, such as energy use, water discharges, or waste generation, among others.

See Appendix B for more information.

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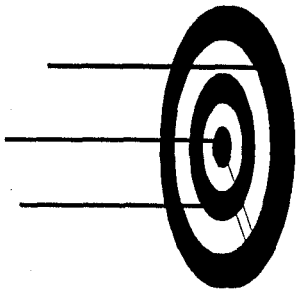


Capture the Learning: Objectives and Targets Worksheet

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 ...	

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MODULE 5: SETTING TARGETS AND MEASURING SUCCESS



For each objective you set for your significant environmental aspects in Module 3, you will set a corresponding target. A target is a detailed performance requirement. Using the Module 4 press cleaning example, assume that the alternatives evaluation showed that the Company could reduce air and water releases both in the plant and at the laundry by substituting Product B, and that this shows an acceptable level of performance and cost. The environmental target then could be stated as follows:

> Reduce air releases of regulated chemicals in press cleaner by 80% in the plant, and reduce the volume of regulated chemicals on used wipers by 40% by the end of a 12-month period through product B substitution and improvements in work practices.

☞ Tip

State your target in terms of the environmental improvement to be achieved, rather than the means of achieving it. For example, "reduce air releases of X" rather than "substitute X." The desired improvement may continue for a long time, but the means may change with circumstances.

The evaluation showed you what is possible in terms of reducing air and water releases, and also showed you the best means to accomplish that objective. When you frame your target consider how you will measure the results. You will need to establish ways of measuring your progress in meeting the targets, in order to both evaluate your process and document success. Time frame is also important. How long will it take you to implement the program, which includes training people, acquiring new product, phasing out old product, acquiring equipment, defining new work procedures for several steps of the production process, and establishing operational controls for changed processes?

☞ Tip

Be sure to consider what operational controls may be needed for any new processes. Refer to Module 6 for help.

Measuring Results

Some say that "an EMS without an effective monitoring and measurement program is like driving at night without the headlights on – you know that you are moving but you can't tell

where you are going!"[5]

For each target, identify a measurement for success, e.g. volume of waste or energy used or percent of cartridges recycled (see Worksheet 5-1). These measurements, also called performance indicators, should be:

- simple and understandable,
- objective,
- verifiable,
- linked to production, and
- relevant to your objectives.

☞ **Tip**

Measuring and evaluating environmental performance is an ongoing process.

Below are some sample performance indicators:

- tons of SO_2 released per unit of electricity produced,
- pounds of hazardous substance "X" emitted per unit of product, or per dollars of sales, and
- percentage reduction in the discharge of a material in a given year versus that in a base year.

Measure changes in the aspect (e.g., reduced waste) with respect to production or sales rather than by itself in order to evaluate environmental improvement. Changes in the aspect can be caused by changes in the sales volume with no real environmental improvement. Each measure should be an indicator of where problems may be occurring in the process. Worksheet 5-1 is designed to assist you in tracking your measurement indicators.

[5]Environmental Management System: *An Implementation Guide for Small and Medium-Sized Organizations*, NSF International, Ann Arbor, Michigan, November 1996, p. 49.

Worksheet 5-1: Environmental Performance Measurement Indicators

Aspect	Objective	Indicator	Date Checked	Who Checked	Result	Corrective Action
Waste Toner Cartridge	Recycle cartridges	Number bought / number recycled	monthly	Office manager	1 missing	Discuss problem with copier maintenance person
Contact Person:				Date Completed:		

In the toner cartridge example, the performance indicators might be the number of toner cartridges used and the number sent for recycling. In the case of the air emissions from the press cleaning, measurements could include:

- amount of press cleaner used per 1,000 images printed,
- amount of press cleaner saved over a selected time period,
- amount of press cleaner used at each press per 1,000 images printed,
- amount of fluid collected from wipes before sending them to the laundry, and
- levels of solvent in water reported by POTW associated with laundering this company's press wipes.

You may be able to think of more. It is important to recognize that each "indicator" measures something different. The first one measures "input" with respect to "output." This ratio is important because changes in use of press cleaner can be caused by fewer print runs, as well as more efficient use of the cleaner during the production process. To be sure that you are measuring success rather than simply reduced production, be sure to include output in your measurement criteria. You may also need to include more than one kind of measurement to understand the results and be able to evaluate the process.



Experience has shown the importance of setting up measurement criteria to assess how things are going.

The second measurement allows you to compare a current time period with previous time periods with respect to press cleaner use, which could help to indicate efficiencies in use, such as better work practices. Again, this comparison should not be made without reference to output over the same time period. Number three also provides a comparison among different work practice methods. Number four shows how much press cleaner is being reused and the reduction in burden on the laundry, and number five shows the success in reducing water releases at the laundry. In a sense, number five is the "acid test" of whether your goal is being met. Without success here, the achievement of the targets within your plant would be meaningless because

the original problem was the water releases from the laundry caused by the wipes. Each of the other measurements shows success in the achievement of targets that are steps toward your final goal. Also, some of these measures can be used to determine cost savings related to particular steps and to the overall goal. Most important, each measure is an important indicator of where problems may be occurring in the process.

If you use special equipment to measure environmental performance, it is important that you maintain and calibrate the equipment on a regular schedule. Again, designate a person to be responsible for this task, provide appropriate training on maintaining the equipment, and document the calibrations schedule. Worksheet 5-2 provides a sample log for calibration.

Worksheet 5-2: Calibration Log

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

Determining Causes of Problems

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.

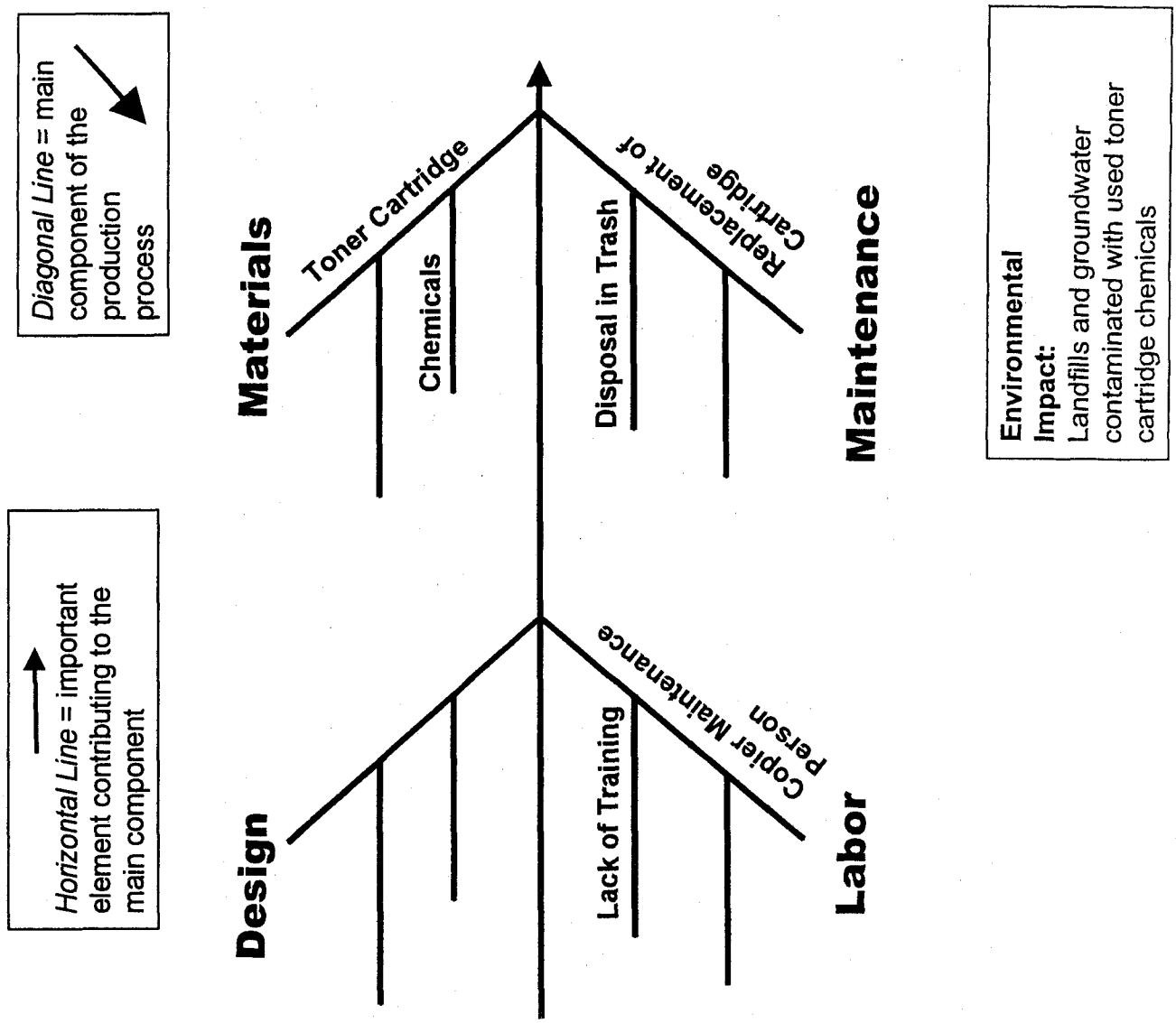
One method is called "root cause analysis." This method can be applied here to identify causes for not meeting targets. You can also use it to determine the possible causes of a potential impact. You should determine the root cause of each of your significant aspects.

The root cause diagram, shown in Figure 5-a, will help you organize your thinking when you analyze your company's potential for environmental impact. This analysis can be done by one person or by a group, with one person writing down the ideas produced. Each diagonal line represents a main component of the production process. Your company may have different or additional components (for example, "disposal") beyond those represented here. Each horizontal line stemming from the diagonal represents an important element contributing to each of the main components. For example, elements of work practices might contribute to the labor component. This diagram is simply a device to help organize the analysis of the cause of potential environmental impacts. Use it if it helps, but don't get hung up on trying to make it work.

☞ Tip

For more information on constructing a "Cause and Effect Diagram," go to www.sytsma.com/tqmtools.cause.html

Figure 5-a. Root Cause Diagram



The following are typical, but not necessarily obvious, causes of problems:

- poor communication,
- faulty or missing procedures,
- equipment malfunction (or lack of maintenance),
- lack of training,
- lack of understanding (of requirements), or
- failure to enforce rules.

Be sure that you have considered these possibilities in your environmental impact analysis.

Taking corrective action

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. The following is a checklist to help complete corrective action. Have you:

- Identified the problem(s)?
- Identified the cause(s)?
- Come up with a solution for each?
- Implemented the solution(s)?
- Documented the solution(s)?
- Communicated the solution(s)?
- Documented the action(s)?

Worksheet 5-3 is a sample Corrective Action Notice that will assist in documenting the resolution process.

Worksheet 5-3:* Corrective Action Notice	
Issue Date:	Solution Due Date:
Requested by: Issued to:	
Problem Statement:	
Most Likely Causes:	
Suggested Solutions:	
Action Taken:	
Measured Results:	
Corrective Action Closed by:	Date:
Contact for Notice:	Date completed:

*Report results on TCA-01 in the *Company Manual Template.*

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2.4 Setting Objectives and Targets [ISO 4.3.3]

What the ISO Standard Requires

The ISO Standard requires companies to set targets and objectives for the relevant departments and functions. These must be documented, and kept up to date.

In setting the objectives and targets, companies are to consider:

- Legal and other requirements that the company subscribes to (such as the Metal Finishing Strategic Goals Program, Responsible Care, and local initiatives such as watershed quality initiatives)
- Significant Aspects as previously identified
- Technological Options
- Financial, Operational, and Business requirements

Starting Points

Many companies are comfortable with the process of setting goals and objectives, usually within the context of a Management By Objectives (MBO) approach to financial planning and project tracking. However, setting environmental objectives and targets typically requires access to information that many small companies lack. For example, if you decide to reduce energy use, but know very little about which of your processes use the most energy, your first step may be to do an energy audit of your facility. Then, you could target certain operations, and determine which practices and technologies could improve your performance.

Implementation Tips

1) Start with a short list of objectives. The specific list is up to each company to decide, based on the EMS planning process. Consider what your overall program should include in order to meet your environmental policy objectives (including prevention of pollution, commitment to compliance, and continual improvement). Small companies may not have the resources available to take on more than two or three objectives at one time. This is perfectly acceptable, since you will add new objectives over time as you complete them.

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2) Get good background information so that the targets you set are realistic and achievable. Seek assistance from programs that can provide low or no cost assessments, such as the Manufacturing Technology Centers, Retired Engineers Technical Assistance Program, Manufacturing Extension Partnership, or Industrial Assessment Centers available in your area. Contact your local Chamber of Commerce, or Small Business Assistance Center for sources of assistance and contact information. Many states and counties have also established Pollution Prevention programs that provide a wealth of information, contacts, and resources.

3) Revisit your objectives and targets periodically, and revise them as necessary. Consider how and when you will do this.

4) Make your targets measurable, using information you already collect whenever possible. Use the appropriate metrics, tied to production rates as appropriate. For example, you won't be able to reduce your energy use 10% if your production rate is drastically increasing at the same time. You should express your goals in ways that are tied to the production rates, such as Kilowatt hours used per $100,000 sales, or gallons of waste water discharged per pounds product shipped.

5) Track Objective and Target Progress: List the method for tracking progress in meeting your environmental goals as part of your Environmental Management Program. This allows top management and others involved in the EMS to monitor your progress. This also links to your Environmental Operations and Control procedures, since you have to establish procedures for generating and keeping the information. Note that if for some reason you are not meeting your targets as you planned, the EMS will require you to figure out why, and to make changes necessary to get back on track.

Examples

Most companies developed a target tracking worksheet to list all of the objectives and targets they have established, along with the specific measurements that will be used to determine when the target is met (see Example 2.4.1). As an alternative, targets could also simply be listed on the Environmental Program Log (see Example 2.5.1). Other companies developed a Target and Objective Tracking Form with one page per target (see Example 2.4.2). This gives more information about how and when the target is to be established, and who is responsible.

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Example 2.4.1 Objective Target and Measurement Worksheet

Sample Objectives	Sample Targets	How to Measure
Reduce Water Use	Reduce water used in scrubbers by 50% by January, 2002	Water Meter, Gallons
Improve Environmental Image	External: Set up Environmental Web Page	Complete? (yes/no)
Reduce Hazardous Waste Generation	Reduce F006 generation by 10% by January, 2000.	Hazardous. Waste Manifests, pounds per 100,000 parts shipped
Reduce Energy Use	Decrease electricity used by 25% per $100,000 in sales	Utility Bills, KW hours per year per $100,000 in sales

Example 2.4.2 Objective and Target Tracking Form

Use One Form per Objective or Target

Date (____/____/____) Individual Responsible:
General XYZ Objective:
Specific Function/Department:
Target Date (Month/Year): (_____/_____)
Specific Objective
Specific Target
Environmental Management System Program Action Plan
How will this objective be met (attach additional pages as necessary):
How will this objective be tracked (attach additional pages as necessary):

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Conformance Check

All of the contributing project participants met the standard requirement to establish documented environmental objectives and targets. Not all, however, chose to have a written procedure for developing objective and targets. While there are many advantages to having a written procedure, the ISO 14001 Standard does not require it.

Some project participants formalized the EMS link between the Planning process (4.3) and Management Review (4.6) in the Objective and Targets procedure. For example;

> "At the end of each calendar year the organization's management reviews its performance with regard to achieving the objectives and targets. This information is used as input to setting objectives and targets for the succeeding year."

This approach strengthens the EMS and helps to ensure conformance over time.

When developing objective and targets, it can be difficult for an organization to be sure the following requirements are considered each time objectives and targets are established:

- Legal and other requirements
- Significant environmental aspects
- Technological options and financial, operational and business requirements
- Views of interested parties

Some metal finishers incorporated these required points into their Objectives and Targets procedure as responsibilities rather than by simply listing them as considerations. The following composite examples show how these points were incorporated into objectives and targets procedures.

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Legal and other Requirements and Significant Environmental Aspects:

> The Environmental, Health and Safety Director reviews the objectives proposed by the EMS Team and provides feedback on applicable laws and regulations and significant site environmental aspects relative to those objectives.

Technological options and financial, operational and business requirements:

> Each shop supervisor and manager evaluates the potential impact(s) of the proposed objectives on his/her functional (e.g., finance, production) or shop area (e.g., plating, grinding).

Views of interested parties:

> The EMS Team holds a meeting of all staff members to discuss the development of environmental objectives (this considers the internal interested parties). The Environmental, Health and Safety Director is responsible for considering the views of external interested parties.

Of the metal finishers that elected to write a procedure for objectives and targets, the requirement for consistency between the environmental policy (including the commitment to prevention of pollution) and the objectives and targets was included.

EMS Links

When you modify the environmental objectives and targets (e.g., as a result of Management Review, or new or modified activities, products, or services) many other parts of your EMS may also be effected. The following EMS links should be reviewed and revised as necessary:

- Policy; Environmental management program: It is important for the long-term maintenance of your EMS to recognize the strong link between objectives and targets and the environmental policy. The objectives and targets must be consistent with your policy. Therefore, when your objectives, targets, and environmental management program changes, check whether or not the changes are consistent with your policy statement.

- Environmental aspects; Legal and other requirements: These two parts of the standard provide input to setting objectives and targets. Other impacts include technological options, financial considerations,

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operational and business requirements, and the views of interested parties.

- Communication: The standard requires you to communicate information regarding the EMS (which includes objectives and targets) to various levels within your company. If you decide to relay environmental information to interested parties, the objectives and targets may be part your communication.

- Operational control: The standard does *not* require written procedures for every operation or activity. Objectives and targets are one of the criteria you should use to determine operations and activities require written procedures.

- Management Review: One objective of the management review is to determine if the objectives and targets need to be modified.

ELEMENT 2.3

OBJECTIVES AND TARGETS

After you identify the C/U's environmental aspects and impacts and regulatory compliance requirements, objectives and targets should be developed for the significant, or highest priority, environmental aspects and compliance concerns. An **objective** is a facility goal that is consistent with the C/U's environmental policy, priority environmental aspects and impacts, and applicable environmental regulations. A **target** is a more detailed performance goal related to and supporting a specific objective. In other words, specific targets must be met for an objective to be achieved.

Defining EMS objectives and targets on a regular basis is a central feature of an EMS that "works." In a sense, the entire EMS is an "engine" for achieving environmental goals (i.e., objectives and targets) that will lead to continual improvements in environmental performance (consistent compliance and source reduction).

EXAMPLES OF C/U OBJECTIVES AND TARGETS	
Objective	**Target**
Reduce hazardous waste generation from chemistry labs	• Decrease quarterly quantity of lab-pack hazardous waste by 15% by March 2002 compared to 2000 quarterly average
Purchase "greener" janitorial chemicals	• Replace three high-use products with alternatives safer for the environment, employees, and students by January 2002
Conserve energy in nonresidential campus buildings	• Decrease kWh use by 10% by January 2002 compared to 2000 same month use
Improve solid waste management	• Increase recycling diversion rate to 50 percent (including food waste) by January 2002
Improve hazardous waste compliance	• Minimize hazardous waste and improve compliance by substituting aqueous parts washers for solvent cleaners in Fleet Operations by January 2002.
Improve fuel storage compliance	• Develop standardized forms/reports and master schedule for all compliance obligations relating to each of the 27 fuel storage facilities

Improve C/U's environmental standing and image with the local community	• Produce and make available C/U Annual Environmental Report via website; promote at least four accomplishments during 2001 through local press releases

EMS Objectives reflect priority aspects and compliance issues and targets should be:

- Manageable: 3-5 objectives and targets at a time that you feel will be successful
- Realistic (achievable within a 12-month timeframe)
- Linked to a source (of the waste or environmental aspect)
- Related to a baseline
- Quantitative (that is, measurable)
- Normalized (that is, scaled to the level of activity)

The objectives and targets represent the transition from planning to action. Many other EMS elements, particularly measurement and monitoring activities, will be driven by the objectives and targets. For this reason, they should be carefully expressed and energetically communicated to all C/U participants. In addition, endorsement from C/U administration and input from faculty, students, and staff affected by the objective is critical in developing targets that are meaningful and practical. Reviewing the objectives and targets at regular intervals provides a good opportunity to gauge progress, cost savings, and improved environmental performance.

Simply stating EMS objectives and targets seldom initiates action. Therefore, **a reasonably detailed action plan should be prepared for each objective**. These action plans, sometimes referred to as "environmental management programs," should include details that address "who, how, and when," an objective will be reached. That is, the action plan should define responsibilities for particular actions, describe how the actions will be taken, and set deadlines for completing the actions.

Objectives and targets originate from:

- Environmental Policy
- Aspects and Impacts Review
- Compliance Review
- Corrective and Preventive Action

Identifying a production or activity metric that can be used to normalize data collected to measure progress is an essential part of developing an action plan. **Normalization** where appropriate is the only true method to gauge progress toward EMS targets because increases or decreases in activity can skew data collected under EMS measurement and monitoring. For example, if water conservation is an EMS objective and campus-wide water use is the parameter measured for the target, an increase in student enrollment might affect water use reduction efforts. Examples of normalization metrics that might be used at C/Us include:

- C/U-wide: Student enrollment (campus-wide or in particular classes and labs)
- Pesticide Use: Acres of grounds landscaped
- HVAC Energy Use or Janitorial Chemical Use: Square feet of building space maintained
- Vehicle Maintenance: Number of vehicles or miles traveled

Implementation: *Procedure 2.3, Objectives and Targets,* describes the process your C/U should follow to develop and update its environmental objectives and targets and associated action plans. Complete the EMS tools that support this procedure, including a summary table and action plans for each objective and target that facilitate and document the process of developing objectives, targets associated with those objectives, and parameters that will be measured to track progress made to meet the objective.

SAMPLE PROCEDURE ONLY – REVISE AS NEEDED

[C/U Name]	EMS Procedure	2.3
	Effective Date	
	Subject	**Objectives and Targets**

Purpose This procedure is used to (1) develop and update the EMS objectives and targets and (2) create action plans for achieving the objectives.

Step 1 The EMS Manager and EMS Participants are responsible for developing the EMS objectives and targets. Similar to the aspects and impacts review, the EMS Manager solicits input from [C/U Name] departmental staff to ensure that objectives and targets are realistic and achievable.

Objectives are goals that are consistent with the organization's environmental policy, priority environmental aspects, and applicable environmental regulations.

Targets are detailed performance goals related to, and supporting a specific objective. Targets should be quantitative, realistic, linked to a source, measurable, and related to a baseline and normalization metric.

Step 2 Objectives and targets will be linked to significant environmental aspects and compliance issues identified by EMS Procedures 2.1 and 2.2, respectively.

Step 3 An action plan will be developed for each objective. Each action plan will describe specific actions needed to achieve the objective, the resources needed for each action, the person responsible for each action, and deadlines.

Step 4 Progress in achieving EMS objectives and targets will be tracked according to procedures described in Element 4.1, Measurement and Monitoring.

Step 5 On a monthly basis, the EMS Manager and other [C/U Name] departmental and facility staff will (1) review objectives, (2) discuss the impact of corrective and preventive actions on objectives and targets, (3) determine whether existing objectives should be modified based on experience from the action plan and (4) develop new EMS objectives when existing objectives are met.

Responsible Person: _____

Signature and Date: _____

Step 6 Every 6 months, the EMS Manager will prepare a status report of progress against objectives and targets for the [C/U Name] administration for review and input.

Step 7 Objective and target documentation will be retained for at least 2 years.

Responsible Person:	_____
Signature and Date:	_____

Summary of EMS Objectives and Targets

Objective	Target	Aspect Addressed	Measurable Parameters for Tracking Progress
1.			
2.			
3.			
4.			
5.			

_____
Responsible Person

_____
Effective Date

OBJECTIVE: _____

TARGET(S): _____

BASELINE: _____

DEADLINE: _____

ASPECT(S): _____

Parameter	Measurement Frequency

OPERATION(S) THAT ARE SOURCE(S) OF ASPECT(S) ADDRESSED: _____

_____

_____

ACTIONS PLANNED AND TAKEN TO ACHIEVE OBJECTIVE

Consider what type of actions you are evaluating to achieve targets for objectives. Are there pollution prevention alternatives such as source reduction, material substitution, in-process recycling, or waste minimization that could achieve your objectives and targets? Try to find an action that addresses the source most directly.

Action 1: _____

_____

Resources Needed: _____

Deadline: _____ Responsible Person: _____

Action Taken: _____

_____

Action 2: _____

_____

Resources Needed: _____

Deadline: _____ Responsible Person: _____

Action Taken: _____

_____

_____

Responsible Person

_____

Effective Date

Action 3: _____

_____

Resources Needed: _____

Deadline: _____ Responsible Person: _____

Action Taken: _____

_____

Action 4: _____

_____

Resources Needed: _____

Deadline: _____ Responsible Person: _____

Action Taken: _____

_____

Action 5: _____

_____

Resources Needed: _____

Deadline: _____ Responsible Person: _____

Action Taken: _____

_____

Action 6: _____

_____

Resources Needed: _____

Deadline: _____ Responsible Person: _____

Action Taken: _____

_____

Notes:

_____

_____

_____

_____

Responsible Person

_____

Effective Date

[redacted]

OBJECTIVE: Purchase "Greener" Janitorial Chemicals

TARGET(S): Replace 3 high-use products with "green" alternatives

BASELINE: January 2001 Janitorial Chemical Use (see January Use Audit – not attached)

DEADLINE: January 2002

ASPECT(S): Human health and ecological safety

Parameter	Measurement Frequency

OPERATION(S) THAT ARE SOURCE(S) OF ASPECT(S) ADDRESSED: Building services

ACTIONS PLANNED AND TAKEN TO ACHIEVE OBJECTIVE

Consider what type of actions you are evaluating to achieve targets for objectives. Are there pollution prevention alternatives such as source reduction, material substitution, in-process recycling, or waste minimization that could achieve your objectives and targets? Try to find an action that addresses the source most directly.

Action 1: Review purchasing records to determine high-use products

Resources Needed: Purchasing records

Deadline: July 1, 2001 Responsible Person: Jim S.

Action Taken: June 1, 2001 – Identified five high-use products for action: toilet bowl cleaner, carpet spot remover, glass cleaner, metal cleaner, and bathroom cleaner

Action 2: Obtain current MSDSs for high-use products

Resources Needed: MSDSs

Deadline: July 31, 2001 Responsible Person: Jim S.

Action Taken: June 15, 2001 – Obtained MSDSs.

Responsible Person

Effective Date

[redacted]

Action 3: Establish criteria to evaluate the environmental preferability of janitorial products

Resources Needed: EMS team to help establish criteria

Deadline: August 31, 2001 Responsible Person: _____

Action Taken: July 1, 2001 – Gathering criteria from other organizations, haven't yet selected one

Action 4: Screen high-use products against criteria and determine target products to find replacements

Resources Needed: MSDSs and scoring team

Deadline: September 31, 2001 Responsible Person: _____

Action Taken: _____

Action 5: Seek alternative products for targeted high-use products and screen potential replacements against criteria

Resources Needed: Alternative product MSDSs

Deadline: November 15, 2001 Responsible Person: _____

Action Taken: _____

Action 6: Request samples of alternative products and evaluate performance. Establish contracts for approved alternative products

Resources Needed: Samples and vendor contact information

Deadline: December 31, 2001 Responsible Person: _____

Action Taken: _____

Notes:

_____

_____

_____

_____

_____
Responsible Person

_____
Effective Date

7. SET ENVIRONMENTAL OBJECTIVES AND TARGETS, AND DEVELOP AND INSTITUTE IMPLEMENTATION PLANS

Objectives need to be established to support the organization's environmental policy. Where the environmental policy outlines the environmental principles and overall environmental goals of the organization, objectives and targets qualify and quantify these principles into more specific and measurable terms. Establishing objectives and targets for the EMS is the link between setting the policy and implementing the system. The guiding document for establishing objectives is the environmental policy. Targets should be in line with objectives, time constrained, measurable and clear in their accountability for action. Environmental management programs (EMPs) offer a structure for ensuring that responsibilities are assigned and resources allocated to attain your organization's objectives and targets.

Establish objectives to meet your environmental policy. Consider: relevant findings from environmental reviews and identified aspects and impacts.

Set targets to achieve the objectives within a specified timeframe. Targets should be specific and measurable.

Consider these issues:

How do environmental objectives and targets reflect both the policy and significant environmental impacts associated with your activities, products and services?

How have the employees responsible for achieving the objectives and targets had input into their development?

How have the views of interested parties (stakeholders) been considered?

What specific measurable indicators have been established for objectives and targets?

How are objectives and targets regularly reviewed and revised to reflect desired improvements in environmental performance?

Develop objectives

Meet legal obligations versus exceed legal requirements

Look at business objectives (i.e. increasing customer satisfaction by 10% over a period of time)

Look at financials - identify opportunities for cost savings and /or new revenues tied to environmental performance improvements

Set limits - select a smaller number of environmental objectives that you are sure that your facility can handle

Set at least one measurable target for each environmental objective. Break down the objectives into measurable targets.

Establish and maintain documented procedures for measuring progress towards your targets and objectives

Establish and maintain one or more "environmental management programs" (EMPs) for achieving your environmental objectives and targets

EMPs must take into account new developments and new or modified activities, products or services

EMPs should include:

identification of the person or job position who is responsible for achieving the environmental objectives and targets in each relevant function and level

the means or the "action plan" for achieving the targets and objectives

timetables

Ensure that corrective action procedures are incorporated

Consider the following issues:

What is your organization's process for developing EMPs?

Does the environmental planning process involve all responsible parties?

Is there a process for periodic reviews of the EMP?

How do these programs address the issues of resources, responsibility, timing and priority?

How are the EMPs responsive to the environmental policy and general planning activities?

CPW ENVIRONMENTAL MANAGEMENT SYSTEM PROCEDURE

The on-line version and secured hardcopy are the controlled documents. The secured hardcopy will be identified by an "Official Document" stamp giving date of distribution. Any and all other documents are uncontrolled. Contact the EMS Program Manager for revision level status.

Effective Date:	**October 1, 2000**	**Page 1 of 3**
Revision: 2	**Identification Number: EMS – 4.3.3**	
Title:	**Procedures for the Identification and Achievement of Environmental Objectives and Targets**	
Prepared By:	**EMS Procedures Subcommittee**	
Reviewed By:	**EMS Management Steering Committee**	
Approved By:	**William E. Koopman, Jr., General Manager John Cook PE, Assistant General Manager**	
Date Approved:	**August 25, 2000**	

0.0 Requirement **ISO 14001, Sub Clause 4.3.3 Objectives and Targets**

1.0 Purpose

To identify environmental objectives and targets that facilitate achievement of the environmental policy statement.

2.0 Scope

ISO 14001, sub clause 4.3.3 requires a documented process to establish the EMS objectives and targets. This procedure requires the analysis of operational details, environmental impacts, regulatory standards, technological options and financial resources in the establishment of objectives and targets to meet the policy statement.

3.0 Responsibility & Authority

It is the responsibility of the department head to assure an appropriate analysis is conducted in the formulation and setting of objectives and targets.

4.0 Procedure

4.1 Procedure for the Identification and Communication of Objectives & Targets

4.1.1 Using the Policy Statement

The environmental policy statement will be broken down into major subject components. Measurable objectives and associated targets

will be identified based upon significant environmental aspects and impacts.

4.1.2 Considering the Legal Requirements
The major site-specific regulatory requirements, such as obtaining a permit to initiate an operation, permit limits, and other legal requirements will be identified.

4.1.3 Considering the Impacts
Objectives (based upon significant aspects) to reduce adverse environmental impacts of facility operations will be identified.

4.1.4 Considering the Department's Operational Goals
Objectives with targeted timeframes will be set to improve environmental performance, considering available resources and budget constraints.

4.1.5 Considering the Input of Interested parties
An attempt will be made to solicit and record views of interested parties. This can be accomplished through commission meetings, discussions with DHEC, or unsolicited comments expressed by customers, agencies, environmental groups, or affected individuals. A determination will be made whether those comments or suggestions will truly help environmental performance. If so, those reasonable views will be considered for initiating departmental objectives and targets.

4.1.6 Communication of Objectives and Targets
The objectives and targets will be communicated to appropriate associates within CPW and the relevant departments.

4.1.7 Modification of the Objectives and Targets

The objectives and targets will be modified when changes occur in the departments' activities, products, or services.

4.2 Procedure for Achievement of the Objectives and Targets

4.2.1 Prepare an Action Plan
In order to help achieve the set objectives and targets, a separate action plan for each objective will be prepared. All major steps or actions will be identified, including the team or individual to perform the work. Responsibilities and authority will be defined. A timetable for completion of the objective, or steps within the objective, is required.

4.2.2 Dealing With Changes
When problems are encountered during execution of the objective or steps, the action plan must be analyzed and adjusted in order to achieve the target. Excessive adjustments can lead to the inability to complete the objective and lead to an end of cost-effective environmental management.

4.2.3 Designation of Responsibility for Meeting Targets
Responsibilities must be assigned, in order for the target to be achieved. It is important to designate key individuals and define responsibilities and authority at each organizational level to achieve the target plan. Completion of objectives and targets will also require assigning responsibility for completion of certain action steps outside of the department.

4.2.4 Objective and Target Tracking System
The department head is responsible for tracking the progress or steps on individual objectives and targets. Monthly operating reports will be submitted showing the status of progress.

5.0 Related Documentation

5.1 Environmental Policy Statement
5.2 Environmental Aspects
5.3 Legal and Other Requirements
5.4 Monthly Operating Report

Naval Aviation Depot, CA

ISO 14001 Procedure

Title	Document Effectivity	Status
Objectives and Targets	First Issue Date 01/22/1999 Revision Date 10/25/1999	Issued
EMS Procedure No	**EMSMR**	Rev
EMSP433	Melito M Barrera/NI/NADEP	1

Purpose

To establish and maintain EMS objectives and targets to be achieved by the OUs. The objectives and targets will be consistent with the SEA s and the Environmental Policy.

Scope

This procedure applies to the selection of EMS objectives and targets. The process to select objectives and targets will consider the following:

- SEAs (EMSP 431);
- financial, operational and business requirements;
- legal and other requirements (EMSP 432);
- technological options; and
- views of interested parties (EMSPs 443a and 443b).

Responsible Party	Responsibilities
EMS MR	• Coordinates selection of objectives and targets by the OUs. • Ensures OU-approved objectives and targets are presented to the ESC.
OUMR	• Prepares the EMP form.
OUM	• Reviews and approves the OU's objectives and targets.
ESC	• Ensures OU-approved objectives and targets are consistent with the Environmental Policy and the scope of this procedure.

PROCEDURE

1. The OUMR will:

a. Propose objectives and targets for the selected SEA improvement projects (see EMSP 431) and record these on the EMP form (see EMSP 434).

b. Submit the objectives and targets recorded on the EMP form to the OUM for review and approval.

2. The OUM will:

a. Review proposed objectives and targets to ensure consistency with the scope of this procedure.

b. Approve, modify or disapprove of the objectives and targets prior

to transmitting approved EMP forms to the EMS MR.

3. The EMS MR will:

a. Compile the OUM-approved objectives and targets for presentation to the ESC which:

- Exceed $25,000 in implementation costs, or;
- Result in significant changes to existing workload, business practices, or management systems, or
- Address correction of compliance deficiencies.

b. Record the ESC decisions and initiate implementation of the SEA improvement projects (see EMSP 434).

4. The EPO will:

a. Submit objectives and targets to the EMS during each EMS cycle (see EMSP 46) to support the commitment of compliance to all relevant environmental legislative, regulatory, permit and other requirements.

5. General Guidance

a. Review of the progress of SEA improvement projects (see EMSP 434) may result in the modification of objectives and targets or the creation of new objectives and targets.

References

ISO 14001:1996, Section 4.3.3

EMSP 431 Environmental Aspects

EMSP 432 Legal and Other Requirements

EMSP 434 Environmental Management Program

EMSP 443a Internal Communication

EMSP 443b External Communication

EMSP 46 Management Review

Environmental Policy

Document Edited By:
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- Design, construct, and operate City facilities to minimize environmental impacts by incorporating energy efficiency, water conservation, waste minimization, pollution prevention, and resource-efficient materials through all phases of a facility's life.
- Seek the commitment of all employees to environmental stewardship through communication, training, and support for employee leadership;
- Involve our citizens in improving our environmental performance;
- Develop and maintain cooperative relationships with regulatory agencies and tribal governments;
- Collaborate with other organizations to achieve shared environmental goals.

The planning process (described in Section 2) included establishing the City's environmental policy, reviewing the general environmental aspects of operations, and identifying the associated legal requirements. Based on the results of that process and consistent with the policy statement and associated principles, the following objectives were established. The objectives provide direction for developing specific policies and procedures and form the basis for monitoring our progress.

The City's environmental objectives are to:

- Comply with regulations;
- Reduce pollution at the source;
- Reduce consumption of resources; and
- Continually improve environmental performance.

The specific environmental policies and procedures found in Section 6 address the City's activities, products, and services that have potentially significant environmental impacts. These policies and procedures provide policy direction for departmental operations and clarify roles and responsibilities. Implementation of the procedures is intended to move the City toward achieving its environmental objectives. City of Seattle

5.2 Environmental Indicators and Targets

This section of the Environmental Management Program (EMP) Manual describes how the City will "keep score" of its environmental performance. Environmental indicators serve as part of an organization's feedback loop, indicating the effectiveness of actions and programs in achieving its objectives. Environmental indicators also serve as a way to communicate clear information to the stakeholders about the City's progress.

ISO 14031 (now a draft international standard) is the member of the ISO 14000 series of standards that addresses environmental performance. The draft ISO 14031 guidance classifies environmental indicators into two categories:

- Environmental Condition Indicators (ECIs)
- Environmental Performance Indicators (EPIs)

ECIs relate to local, regional, or global measures regarding the condition of the environment. Ambient air quality parameters are an example. Several of these types of indicators are identified for the City in *"Seattle's Comprehensive Plan—Monitoring Our Progress"* (1996).

EPIs relate to the activities and outputs that can affect ECIs. Air emissions from the City's fleet vehicles are an example.

ISO 14031 further divides EPIs into two sub-categories:

- Operational Performance Indicators (OPIs)
- Management Performance Indicators (MPIs)

OPIs are the most direct measures of environmental performance. This type of indicator measures the actual output or load that the organization is placing on the environment.

MPIs can be considered leading indicators of environmental performance. This type of metric measures those program activities undertaken by management with the goal of improving OPIs (the actual load placed on the environment). For example, in order to decrease the use of energy and water (and thus the actual load on the environment), programs might be implemented to retrofit City facilities to improve energy or water efficiency, employees might attend training courses on conservation, or energy and water audits might be conducted. Improved environmental performance can ultimately be expected to improve environmental conditions, which are measured by ECIs. These linkages are illustrated in Figure 5.

Figure 5: City of Seattle Environmental Performance and Condition Indicators

The criteria for selecting the EPIs for the EMP included the following considerations:

- Is it of interest and relevance to key stakeholders of Seattle (e.g., employees, citizens, City Council, etc.)?
- Is it relatively easy to measure and collect?
- Is it easy to understand?
- Does it have the potential for cost savings to the City?
- Will it be broadly applicable across City departments?

For most of the indicators, the City will start by measuring trends. This data will be

evaluated annually to assess whether the trends are in the expected direction. Specific targets are being established for the following indicators:

- Energy used by the City fleet
- Regulatory violations
- Facility site visits
- Facility compliance assessments

Figure 6 details the Citywide objectives, EPIs, and targets along with departmental responsibilities for data collection.

6 ENVIRONMENTAL POLICIES AND PROCEDURES

The ISO 14001 standard specifies the following for environmental policies:

Top management shall define the organization's environmental policy and ensure that it:

- *is appropriate to the nature, scale, and environmental impacts of its activities, products, or services;*
- *includes a commitment to continual improvement and prevention of pollution;*
- *includes a commitment to comply with relevant environmental legislation and regulations, and with other requirements to which the organization subscribes;*
- *provides the framework for setting and reviewing environmental objectives and targets;*
- *is documented, implemented and maintained and communicated to all employees;*
- *is available to the public. (Source: ISO 14001, Section 4.2)*

This section contains the City's policies and procedures on specific environmental aspects.

6.1 Compliance Assessment

6.1.1 Purpose

The purpose of this policy is to establish an assessment program to evaluate compliance of City facilities with applicable environmental requirements, to identify risks and liabilities, and to ensure that corrective actions are implemented in a timely fashion.

6.1.2 Organizations Affected

- *A direct link to DEQ's strategic planning and budgeting process;*
- *Appropriate procedures and training; and*
- *Performance measures, self-assessment, and independent assurance reviews.*

Dennis H. Treacy, Director
Virginia Department of Environmental Quality

This Environmental Policy shall be communicated to all employees by the EMS Manager and maintained on DEQ's website by the Public Affairs Manager.

2. Environmental Aspects, Objectives and Targets, and Environmental Management Programs

2.1. Environmental Aspects

Each year, in the month of February, the EMS Program Team (see Structure and Responsibility, §4) shall 1) develop an inventory of DEQ's environmental aspects and impacts, 2) determine which aspects are potentially significant impacts and 3) use this information in establishing environmental objectives and targets for the upcoming fiscal year.

The results of exercising this procedure shall be maintained by the EMS Manager in a document that records the findings of the EMS Program Team, the environmental objectives and targets, the management programs and plans for achieving them, and progress toward achieving environmental objectives and targets.

2.2. Objectives and Targets

Concurrent with its determination in February of each year as to which of DEQ's environmental aspects are potentially significant environmental impacts, the EMS Program Team shall establish environmental objectives and targets for the upcoming fiscal year. These Environmental Objectives and Targets shall be documented and maintained by the EMS Manager.

2.3. Environmental Management Programs

Concurrent with its determination in February of each year as to which of DEQ's environmental aspects are potentially significant environmental impacts and its establishment of Environmental Objectives and Targets, the EMS Program Team shall establish management plans and programs to achieve the environmental objectives and targets for the upcoming fiscal year. These management plans and programs shall include designation of person(s) responsible for their achievement, means and methods of achievement, and timeframes for achievement. These Management Plans and Programs shall be documented and maintained by the EMS Manager.

3. Legal and Other Requirements

In line with DEQ's Environmental Policy commitment to complying *"with all applicable environmental laws and regulations,"* the Director shall require the Director of Administration and each of the Regional Directors to compile archives of relevant environmental laws,

EMS PROCEDURE: SETTING AND TRACKING OF ENVIRONMENTAL OBJECTIVES AND TARGETS

I. Purpose

The purpose of this procedure is to ensure that the organization establishes and maintains documented environmental objectives and targets.

II Scope

This procedure applies to environmental objectives and targets set at all relevant levels within the organization.

III. Definitions

Environmental (or environmental) objective- A site goal that is consistent with the environmental policies and considers significant environmental impacts and applicable laws and regulations. Objectives are quantified wherever practicable.

Environmental (environmental) target- A detailed performance requirement (quantified wherever practicable) based on an environmental objective. A target should be met in order for the underlying objective to be achieved.

IV. General

The organization establishes environmental objectives and targets in order to implement the environmental policies. Objectives and targets also provide a means for the organization to measure the effectiveness of its environmental efforts and improve the performance of the environmental management system. In establishing environmental objectives, the organization considers:

- applicable laws and regulations (and requirements of other programs, such as ...);
- environmental aspects of the organization's activities and products;
- technological, financial, operational, and other organizational requirements; and,
- the views of employees and other interested parties.

Based on the organization 's environmental objectives, targets are established for different functions within the organization and for different areas of the plant. For example, the organization may establish an environmental objective to "reduce waste generation by 10% per year". Based on this objective, different areas of the plant might set targets for reducing individual waste streams in order to ensure that the organization's objective was achieved. An organization-wide environmental objective might also be translated into individual projects (such as changes in production processes, materials or pollution control equipment) in different plant areas.

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V. Procedure

A. The organization's top management is responsible for establishing environmental objectives on an annual basis. To initiate the process, the Plant Manager holds a meeting of all staff members to discuss the development of environmental objectives.

B. Objectives are action- and prevention-oriented and are intended to result in meaningful improvements in the organization 's environmental performance.

C. Each plant area or functional manager is responsible for providing input from his / her own function (Finance, Engineering, etc.) or shop area (Fabrication, Assembly, Shipping / Receiving, etc.). The organization's environmental manager is responsible for providing input on applicable laws and regulations, significant site environmental impacts, and the views of interested parties. (These inputs are obtained from the separate analyses required by Procedure #'s).

D. As a starting point, the organization's management evaluates its performance against environmental objectives for the current year. As part of this effort, management examines the results of its environmental performance evaluations.

E. Preliminary environmental objectives are developed for further discussion and evaluation. Each manager is responsible for evaluating the potential impacts within his / her functional or shop area (if any) of the proposed environmental objectives. The organization's environmental manager reviews proposed objectives to ensure consistency with the overall environmental policy.

F. Environmental objectives are finalized, based on review comments from site managers and employees. Each manager identifies the impacts of the objectives in his / her function or shop area, establishes targets to achieve the objectives, and develops appropriate measures to track progress towards meeting the objectives and targets.

G. Each manager is responsible for communicating objectives and targets (and the means for achieving them) to others in his / her part of the organization.

H. Progress towards the objectives and targets is reviewed on a regular basis at management meetings. The progress is also communicated to plant employees via bulletin boards and other similar means.

I. At the end of each calendar year, the organization's management reviews its performance with regard to achieving the objectives and targets. This information is used as input to setting objectives and targets for the succeeding year.

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Sample Process Tool for Setting Objectives & Targets

Step 1: A **cross-functional team** is a good way for your organization to set realistic objectives and targets. **List here** who needs to be involved on the team:

Name	Contacted?
•	•
•	•
•	•
•	•
•	•
•	•

Step 2: Think about what **information sources** your team will need to establish objectives and targets. Pull together information sources such as:

Information Sources	How they will help
	e.g.,
• process maps	• *identify process steps with environmental aspects*
• waste, and emission data	• *determine current wastes and sources*
• site maps	• *etc.*
• compliance audit reports	
• list of identified environmental aspects and impacts	
• communications from interested parties	
• others??	
•	
•	
(you may also want to do a plant tour or "walk through" to identify other issues)	

Step 3: Is there other information that might be helpful to the team?

Other Information Needed	Where we will get it
•	•
•	•
•	•

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Step 4: List the significant environmental impacts (you identified these earlier). You can **categorize** these impacts by type:

Energy Use	Raw Materials	Air Impacts	Water Impacts	Waste Impacts	Land Issues	Other (specify)

Step 5: Look at **processes** (such as plating or assembly) and **activities** (such as shipping or purchasing). Are there any **other issues** the team should consider, in addition to those listed above as significant impacts? (For example, you might want to establish an objective to reduce spills of hazardous materials at the loading dock, even if this was not identified as a potentially significant environmental impact.)

Process or activity	Issues	Possible Objectives & Targets

Step 6: List any new **regulatory requirements** that affect the facility (or other regulations for which the need for additional actions has been identified).

Regulations, other requirements	Possible Objectives & Targets

Step 7: Consider inputs from **interested parties**. Any need for additional objectives related to views of neighbors, community groups or other parties?

Inputs from Interested Parties	Possible Objectives & Targets

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Step 8: Look at the lists of **possible objectives developed in Steps 4 -7**. **Brainstorm** with the team on whether these objectives are:

- reasonable,
- technologically feasible,
- consistent with other organizational plans/goals, and
- affordable.

List preliminary objectives and targets based on this exercise:

Selected Preliminary Objectives
•
•
•
•
•

Step 9: Determine how you will **measure** each of the selected preliminary objectives. (If you cannot establish an effective way to measure it, put that objective "on-hold" for later consideration).

Selected Objectives	Performance Indicator(s)

Step 10: For each objective that you selected, determine **who** is going to develop the **action plan** (who, what, when, where, how). List these names below:

Selected Objectives	Responsibility for Action Plan

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Sample Procedure:
Setting Objectives & Targets

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NASA White Sands Test Facility, NM
Fall 2000

Section C

Tell us about your past achievements and future commitments.

Why do we need this information?

Facilities must show that they are committed to improving their environmental performance. This mec that you can describe past achievements and will mc future commitments.

What do you need to do?

Refer to the Environmental Performance Table in the instructions to answer questions 1 and 2.

1 **Describe your past achievements for at least two environmental aspects. If you need more space than is provided, attach copies of this page.**

Note to small facilities: If you qualify as a small facility as defined in the instructions, you are required to report past achievement for at least one environmental aspect.

First aspect you've selected

What aspect have you selected?	What was the previous level (2 years ago)?		What is the current level?	
	Quantity	Units	Quantity	Units
Emissions of ozone-depleting chemicals	650 (CY97)	gallons	310 (CY99)	gallons

i. How is the current level an improvement over the previous level?

Current level is approximately a 47% reduction from the previous level.

ii. How did you achieve this improvement?

1. Relacement of CFC-113 with HFE-7100.
2. Replacement of vapor degreasers with those using less solvent.
3. Shutting down vapor degreaser until need arises.

Second aspect you've selected

What aspect have you selected?	What was the previous level (2 years ago)?		What is the current level?	
	Quantity	Units	Quantity	Units
Hazardous Solid Waste: Reduction	1,340	lbs	0	N/A

i. How is the current level an improvement over the previous level?

Petroleum naptha is utilized for precision cleaning of spacecraft components. After a period of use, the naptha becomes unusable because it fails to meet stringent aerospace cleaning standards. Previously, it was disposed of as hazardous waste. Now Safety-Kleen takes the product for drum cleaning at their facility, as part of their continual use program.

ii. How did you achieve this improvement?

WSTF captures the solvent and sends it to Safety-Kleen, who uses the solvent as product since it meets their specifications.

2 Select at least four environmental aspects (no more than two from any one category) from the Environmental Performance Table in the instructions and then tell us about your future commitments. If you need more space than is provided, attach copies of this section.

Note to small facilities: If you are a small facility, you are required to make commitments for at least two environmental aspects in two different categories.

First aspect you've selected

a. What is the aspect? Energy Use

b. Is this aspect identified as significant in your EMS? ☐ Yes ☒ No

c. What is the current level? You may choose to state this as an absolute value or in terms of units of production or output.

☒ Option A: Absolute value — 173,000 BTU/sq. ft. (Quantity/Units)

☐ Option B: In terms of units of production or output — (Quantity/Units)

d. What is the improvement you are committing to over the next three years? You may choose to state this as an absolute value or in terms of units of production or output.

☒ Option A:
Absolute value — 167,000 BTU/sq. ft. (FY03) (Quantity/Units)

☐ Option B:
In terms of units of production or output — (Quantity/Units)

e. How will you achieve this improvement?

High-use energy areas will be targeted for energy use alternatives and/or more efficient energy technologies.

Second aspect you've selected

a. What is the aspect?

ODC emissions

b. Is this aspect identified as significant in your EMS?

☒ Yes ☐ No

c. What is the current level? You may choose to state this as an absolute value or in terms of units of production or output.

☒ Option A:
Absolute value — 310 gallons (CY99) (Quantity/Units)

☐ Option B:
In terms of units of production or output — (Quantity/Units)

d. What is the improvement you are committing to over the next three years? You may choose to state this as an absolute value or in terms of units of production or output.

☒ Option A:
Absolute value — 235 gallons (CY00) (Quantity/Units)

☐ Option B:
In terms of units of production or output — (Quantity/Units)

e. How will you achieve this improvement?

WSTF can only commit to an annual goal due to its R&D nature.

1. Replacement of CFC-113 in equipment.
2. "Operate-only-when-needed" equipment.
3. Procure waivers for CFC-113 in NASA specification.

Third aspect you've selected

a. What is the aspect?

Total Solid Waste

b. Is this aspect identified as significant in your EMS?

☐ Yes ☒ No

c. What is the current level? You may choose to state this as an absolute value or in terms of units of production or output.

☐ Option A: Absolute value

(Quantity/Units)

☒ Option B: In terms of units of production or output

10,000 ea.
(Quantity/Units)

d. What is the improvement you are committing to over the next three years? You may choose to state this as an absolute value or in terms of units of production or output.

☐ Option A: Absolute value

(Quantity/Units)

☒ Option B: In terms of units of production or output

0
(Quantity/Units)

e. How will you achieve this improvement?

Security personnel have been instructed to recover the spent brass cartridges at the WSTF Firing Range, and forward them to the Environmental Department for recycling. This will reduce WSTF's total solid waste output.

Fourth aspect you've selected

a. What is the aspect?

Total Materials Use: Reduction

b. Is this aspect identified as significant in your EMS?

☐ Yes ☒ No

c. What is the current level? You may choose to state this as an absolute value or in terms of units of production or output.

☒ Option A: Absolute value

300 reams (at 500 pages per ream)
(Quantity/Units)

☐ Option B: In terms of units of production or output

(Quantity/Units)

d. What is the improvement you are committing to over the next three years? You may choose to state this as an absolute value or in terms of units of production or output.

☒ Option A: Absolute value

150 reams (at 500 pages per ream)
(Quantity/Units)

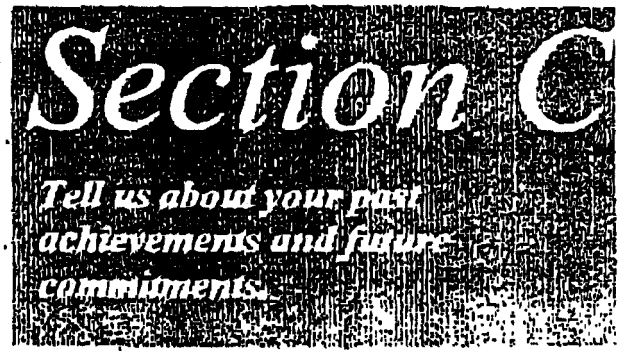
☐ Option B: In terms of units of production or output

(Quantity/Units)

e. How will you achieve this improvement?	WSTF will reduce the amount of waste paper generated through the implementation of the EPA/NMED/NASA Project XL (see enclosed copy). This Project XL highlights the use of an electronic regulatory reporting system (first through the use of CDs, and then to a digitally signed Web-server).

USPS Vehicle Maintenance Facility, Hartford CT

Fall 2000



Why do we need this information?

Facilities must show that they are committed to improving their environmental performance. This means that you can describe past achievements and will make future commitments.

What do you need to do?

Refer to the Environmental Performance Table in the instructions to answer questions 1 and 2.

1 Describe your past achievements for at least two environmental aspects. If you need more space than is provided, attach copies of this page.

Note to small facilities: If you qualify as a small facility as defined in the instructions, you are required to report past achievement for at least one environmental aspect.

First aspect you've selected

Ronald Lapporio 12/6/02

What aspect have you selected?	What was the previous level (2 years ago)?		What is the current level?	
	Quantity	Units	Quantity	Units
Waste: Hazardous Solid Waste	7989 in FY 1992 220 in FY 1998	Gallons	135 in FY 2000	Gallons

i. How is the current level an improvement over the previous level?

Improvement over the baseline year of FY 1992 since the facility generates much less hazardous waste as a result of the implementation of the USPS Northeast Area P2 Program. The Hartford VMF served as the testing facility that was used to indentify P2 opportunities for VMFs throughout the Northeast Area.

A partial list of P2 practices utilized is listed below.

ii. How did you achieve this improvement?

Switch to use of non-hazardous part washers and brake cleaners.

Recycling of antifreeze

Switch to more efficient High Volume Low Pressure (HVLP) Paint Spray Guns.

Switch to high solids/low VOC painting systems = less paint needed to cover same area

Switch from Paint Gun Cleaning Service Contract to USPS owned system = service only as needed

Section C continued

Second aspect you've selected

Ronald Robbins 12/6/00

What aspect have you selected?	What was the previous level (2 years ago)? Quantity	Units	What is the current level? Quantity	Units
Materials Use: Reduction in Hazardous Materials Use	3480 in FY 1992 0 in FY 1998	gallons	0 in FY 1999	gallons

i. How is the current level an improvement over the previous level?

3480 gallons of hazardous parts washing solvent waste has been eliminated per year in exhange for 205 gallons of non-hazardous wastewater solution.

ii. How did you achieve this improvement?

Researched non-hazardous parts washing alternatives in 1994-1996.

Replaced Hazardous Solvent Parts Washing Service contracts with USPS owned units supplied with non-hazardous parts washing solution.

2 Select at least four environmental aspects (no more than two from any one category) from the Environmental Performance Table in the instructions and then tell us about your future commitments. If you need more space than is provided, attach copies of this section.

Note to small facilities: If you are a small facility, you are required to make commitments for at least two environmental aspects in two different categories.

First aspect you've selected

Ronald Robbins 12/6/00

a. What is the aspect? Waste: Hazardous Solid Waste

b. Is this aspect identified as significant in your EMS? ☒ Yes ☐ No

c. What is the current level? You may choose to state this as an absolute value or in terms of units of production or output.

☐ Option A: Absolute value (Quantity/Units)

☒ Option B: In terms of units of production or output

2.49 gallons per vehicle service in FY 1992

0.06 gallons per vehicle service in FY 2000 (Quantity/Units)

d. What is the improvement you are committing to over the next three years? You may choose to state this as an absolute value or in terms of units of production or output.

☐ Option A: Absolute value (Quantity/Units)

☒ Option B: In terms of units of production or output: 0.04 gallons per vehicle service (Quantity/Units)

e. How will you achieve this improvement?

Process and product changes (continued use of Non-Hazardous Products, recycling of process materials,and administrative controls, etc.)

Second aspect you've selected

Ronald Rabbion 12/6/00

a. What is the aspect?

Waste: Total Solid Waste

b. Is this aspect identified as significant in your EMS?

☐ Yes ☒ No

c. What is the current level? You may choose to state this as an absolute value or in terms of units of production or output.

☐ Option A: Absolute value (Quantity/Units)

☒ Option B: In terms of units of production or output: 0.085 gallons per vehicle service in FY 1999; 0.042 gallons in FY 2000 (Quantity/Units)

d. What is the improvement you are committing to over the next three years? You may choose to state this as an absolute value or in terms of units of production or output.

☐ Option A: Absolute value (Quantity/Units)

☒ Option B: In terms of units of production or output: 0.016 gallons per vehicle service (Quantity/Units)

e. How will you achieve this improvement?

Purchase of new parts washing unit that recycles the non-hazardous parts washing solution.

Third aspect you've selected

Ronald Robbins 12/6/00

a. What is the aspect?	Materials Use: Recycled/Re-Used Materials Use
b. Is this aspect identified as significant in your EMS?	☒ Yes ☐ No
c. What is the current level? You may choose to state this as an absolute value or in terms of units of production or output.	☐ Option A: Absolute value (Quantity/Units) ☒ Option B: In terms of units of production or output: 1.79 gallons per vehicle service in FY 2000 (waste to energy disposal and virgin product purchased) (Quantity/Units)
d. What is the improvement you are committing to over the next three years? You may choose to state this as an absolute value or in terms of units of production or output.	☐ Option A: Absolute value (Quantity/Units) ☒ Option B: In terms of units of production or output: 1.25 gallons per vehicle service recycled and rerefined (Quantity/Units)
e. How will you achieve this improvement?	The VMF will re-enter into a closed-loop recycling contract where used oil will be sent for use in the production of rerefined oil which in turn will be purchased back by the VMF. This is an improvement to the one time waste to energy method of disposal and virgin product purchases previously used.

Fourth aspect you've selected

Ronald Robbins 12/6/00

a. What is the aspect?	Air Emissions: Emissions of Greenhouse Gases
b. Is this aspect identified as significant in your EMS?	☒ Yes ☐ No
c. What is the current level? You may choose to state this as an absolute value or in terms of units of production or output.	☐ Option A: Absolute value (Quantity/Units) ☒ Option B: In terms of units of production or output: 9.16 lbs. of solid paper waste per vehicle service in FY 2000 (Quantity/Units)
d. What is the improvement you are committing to over the next three years? You may choose to state this as an absolute value or in terms of units of production or output.	☐ Option A: Absolute value (Quantity/Units) ☒ Option B: In terms of units of production or output: 10 lbs. of solid paper waste per vehicle service (Quantity/Units)

e. How will you achieve this improvement?

Reduction of greenhouse gases is already accomplished thorough the VMFs paper recycling program. The Hartford VMF can contribute further to this reduction by capturing more recyclable paper waste from it's mixed trash dumpster.

If the VMF is also successful in having vendors reduce the amount of paper products used for packaging, this may offset this proposed accomplishment, but will still result in the reduction in the need for virgin paperstock which generates greenhouse gas emissions. Calculations of greenhouse gas reductions will be performed with the assistance of the USEPA Wastewise staff. This information will be provided to the EPA before Jan. 1, 2001.

Ronald Robbins
12/6/00

Fall 2000 Scottsdale, AZ



Why do we need this information?

Facilities must show that they are committed to improving their environmental performance. This mec that you can describe past achievements and will mo future commitments.

What do you need to do?

Refer to the Environmental Performance Table in the instructions to answer questions 1 and 2.

1 Describe your past achievements for at least two environmental aspects. If you need more space than is provided, attach copies of this page.

Note to small facilities: If you qualify as a small facility as defined in the instructions, you are required to report past achievement for at least one environmental aspect.

First aspect you've selected

What aspect have you selected?	What was the previous level (2 years ago)?		What is the current level?	
	Quantity	Units	Quantity	Units
Air Emmisions - Alternative Fuel Use (CNG)	1,457.4	gal/month	4,337.0	gal/month

i. How is the current level an improvement over the previous level?

Dual fueled city fleet vehicles now use three (3) times more Compressed Natural Gas (CNG) compared to one (1) year ago. In these dual fueled vehicles, unleaded gas usage decreased by 10% despite a 20% increase in the total number of dual fueled vehicles in the fleet. There was a 29% increase in total fuel usage, but all of the increase (plus more) was in CNG use. CNG burns cleaner, resulting in fewer air pollution emissions.

ii. How did you achieve this improvement?

The improvement resulted from an incentive/recognition program jointly promoted by Fleet Management and the Environmental Planning & Design Office. Fleet Management also increased their annual budget to convert all new eligible fleet vehicles to dual fuel capacity.

Second aspect you've selected

What aspect have you selected?	What was the previous level (2 years ago)?		What is the current level?	
	Quantity	Units	Quantity	Units
Energy Use - Energy Efficiency, Green Lights Retrofit Program	x - 38,474	Kwh	x - 1,580,000	Kwh

i. How is the current level an improvement over the previous level?

The city's total energy bill was approximately $4 million annually in 1997. Today the annual bill is approximately $3.3 million. A portion of that decrease is attributable to the Green Lights Retrofit Program.

In City facilities totalling 623,797 sq/ft., the annual energy savings totalled $79,513. The reduced Kwh of energy use translates to 3,300,000 pounds of pollution avoided annually. The air pollutants minimized are carbon dioxide, sulphur dioxide, and nitrates of oxygen.

ii. How did you achieve this improvement?

Retrofit more than 90% of all City facilities over a four year period with energy efficient lighting.

2 Select at least four environmental aspects (no more than two from any one category) from the Environmental Performance Table in the instructions and then tell us about your future commitments. If you need more space than is provided, attach copies of this section.

Note to small facilities: If you are a small facility, you are required to make commitments for at least two environmental aspects in two different categories.

First aspect you've selected

a. What is the aspect? Energy Use from HVAC system

b. Is this aspect identified as significant in your EMS? ☒ Yes ☐ No

c. What is the current level? You may choose to state this as an absolute value or in terms of units of production or output.

☐ Option A: Absolute value (Quantity/Units)

☒ Option B: In terms of units of production or output: Approx. 548,347 pounds of pollution generated by energy required to

operate City HVAC systems
(Quantity/Units)

d. What is the improvement you are committing to over the next three years? You may choose to state this as an absolute value or in terms of units of production or output.

☐ Option A: Absolute value

(Quantity/Units)

☒ Option B: In terms of units of production or output

5% reduction (e.g. 27,417 pounds) of pollutants generated by HVAC system energy use within three years
(Quantity/Units)

e. How will you achieve this improvement?

HVAC systems generate roughly 40% of the Total City facility energy use. The City projects and commits to a 5% reduction of pollutants (e.g. carbon dioxide, sulphur dioxide, and nitrates of oxygen) by implementing an enhanced HVAC (Heating, Ventilation, and Air Conditioning) preventative maintenance program.

Second aspect you've selected

a. What is the aspect?

Preservation/Restoration

b. Is this aspect identified as significant in your EMS?

☒ Yes ☐ No

c. What is the current level? You may choose to state this as an absolute value or in terms of units of production or output.

☒ Option A: Absolute value

12,275 acres of preserved habitat
(Quantity/Units)

☐ Option B: In terms of units of production or output

(Quantity/Units)

d. What is the improvement you are committing to over the next three years? You may choose to state this as an absolute value or in terms of units of production or output.

☒ Option A: Absolute value

Acquire, restore, and/or enhance an additional 2,500 acres of wildlife habitat within three years.
(Quantity/Units)

☐ Option B: In terms of units of production or output

(Quantity/Units)

e. How will you achieve this improvement?

1. Land acquisition 2. Schedule preservation clean-ups 3. Revise City ordinances 4. improve trail signage

Third aspect you've selected

a. What is the aspect?

Air Emissions - Emissions of VOC's from City fleet vehicles

b. Is this aspect identified as significant in your EMS?

☐ Yes ☐ No

c. What is the current level? You may choose to state this as an absolute value or in terms of units of production or output.

☐ Option A: Absolute value

☐ Option B: In terms of units of production or output

1) 5,800 gallons of unleaded gasoline or _____ pounds of VOC emissions annually

2) 136 City fleet vehicles currently converted for duel -fuel (CNG) usage

(Quantity/Units)

(Quantity/Units)

d. What is the improvement you are committing to over the next three years? You may choose to state this as an absolute value or in terms of units of production or output.

☒ Option A: Absolute value

☒ Option B: In terms of units of production or output

(Quantity/Units)

1) 5% reduction of VOC emissions or _____ pounds within next three years

2) 5% increase of City fleet vehicles converted with duel-fuel capabilities

(Quantity/Units)

e. How will you achieve this improvement?

Encourage through policy and recognition the increase of CNG usage. Allocate funding to convert additional city fleet vehicles with alternative fueled capabilities.

Fourth aspect you've selected

a. What is the aspect?

Total Solid Waste - Green waste

b. Is this aspect identified as significant in your EMS?

☐ Yes ☒ No

c. What is the current level? You may choose to state

☐ Option A: Absolute value

this as an absolute value or in terms of units of production or output.

☒ Option B:
In terms of units of production or output

(Quantity/Units)

13,492 tons of green waste disposed in landfill
(Quantity/Units)

d. What is the improvement you are committing to over the next three years? You may choose to state
this as an absolute value or in terms of units of production or output.

☒ Option A:
Absolute value

Divert 5% of total green waste presently landfilled and reuse as compost
(Quantity/Units)

☐ Option B:
In terms of units of production or output

(Quantity/Units)

e. How will you achieve this improvement?

Develop a pilot project for the reuse of green waste (brush, leaves, manure, stems, etc.,) materials presently landfilled. Partner with non-profit agricultural organizations, and citizen environmental advisory board to monitor and manage a centralized, seasonal, compost program.

Section D

Tell us about your public outreach and reporting

Why do we need this information?

Facilities must demonstrate their commitment to public outreach and performance reporting. You should have appropriate mechanisms in place to identify community concerns, to communicate with the public, and to provide information on your environmental performance.

What do you need to do?

- Describe your approach to public outreach.
- List three references who are familiar with your facility.

1 How do you identify and respond to community concerns?

Our current methods to receive and respond to community concerns are both centralized and decentralized. For example 1) an environmentally focused call, letter, or e-mail may initially go to our Mayors office and then to our office for dissemination; 2) these same concerns may be directed to other divisions who then forward to our attention for addressing or again dissemination to another department; or 3) our office may be the recipient of the initial call to either address the issue and/or disseminate to another department.

Other examples include:

1. Our environmental hotline (480-312-7990) where citizens may call to address their general concerns and/or seek information.

2. All City of Scottsdale web based pages now include a question of whether the page was useful or not.

3. Most of our hard copy publications, including the Environmental Initiatives Report, includes a pull-out flyer to comment on the publication. This flyer includes postage.

4. During public meetings, citizens may comment verbally in front of the City Council to specific environmental questions. During these matters, staff will address the City Council and

Sample
Objectives and targets

Aspect	Issue	Objective	Target	Program	Procedure	Work Practice
Air emissions	Odor (Coolant systems, WTP)	Control	Minimize odors	EMP-016	EN-L2-013	WP-104
Water usage	Water usage plantwide	Improve	Reduce consumption 3% by 12/97	EMP-006		
Materials storage	Propane tank	Control	Maintain compliance/minimize spill potential	EMP-016	EN-L2-011, EN-L2-024	WP-403
Energy	Overall plant energy usage	Control/ improve	Decrease energy usage by 3%	EMP-005, EMP-017	EQ01-019.01	WP-600-604

4.3.3 Objectives and targets

Establish Baseline Environmental Measurements

- Quantity of raw material or energy used
- Quantity of emissions
- Waste produced per quantity of finished product
- Number of incidents (e.g., exceedances)
- Percentage of waste recycled
- Percentage of recycled content in product

4.3.3 Objectives and targets

Significant aspect	Possible objectives
Accidental spillage	Reduce spillage potential
VOC emissions	Reduce VOC emissions
Raw material use	Reduce material utilization
POTW discharges	Improve compliance with wastewater discharge permit limits

4.3.3 Objectives and targets

Possible objectives	Possible targets
Reduce spillage potential	By August 30, 2000: Install overfill alarms on bulk tanks ; develop written transfer procedures; provide training to affected employees
Reduce VOC emissions	Reduce VOC emissions 5% by December 31, 2000
Reduce material utilization	Increase post-consumer content to 10%
Improve compliance with wastewater discharge permit limits	Zero permit violations for reporting year 2001

4.3.3 Objectives and targets

Possible targets	Possible environmental performance indicators
By August 30, 1999: Install overfill alarms on bulk tanks ; develop written transfer procedures; provide training to affected employees	Completion of project No future spills greater than 5 gallons.
Reduce VOC emissions 5% by December 31, 1999	Lbs. VOC/1000 hours paint time
Increase post-consumer content to 10%	Measure/monitor feedstock blend rate (lbs./unit)
Zero permit violations for reporting year 1999	Quarterly sampling parameter results (mg/l, ppm)

4.3.3 Objectives and targets

Tips for success...

- Establish objectives consistent with your business needs
- Involve people in functional area
- Keep it simple at first
- Be flexible
- Consider cost of tracking and measuring

Environmental Management Programs

4.3.4

Section I

"Environmental Management Program(s)" from NSF Guide

"Establishing an Environmental Management Program" from NSF Metal Finishers Guide

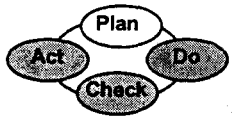
Section II

Naval Aviation Depot North Island Environmental Management Program Procedure

Virginia Department of Environmental Quality Environmental Management Programs Statement

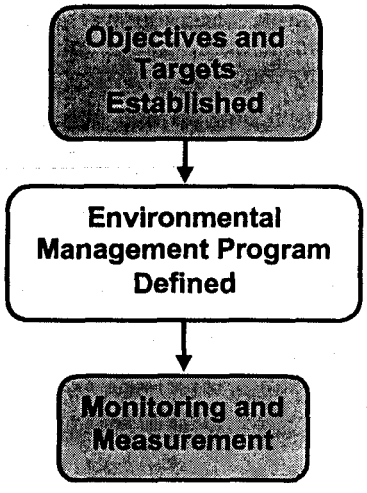
EMP Sample Tool

Comments:



Environmental Management Program(s)

A road map for achieving environmental goals



So far, this Guide has focused on the **foundations** of an EMS -- the planning elements. An important part of this planning effort is defining what your organization intends to achieve in the environmental area. To achieve your objectives and targets, you need an **action plan** – also known as an environmental management program.

Your environmental management program should be **linked directly to your objectives and targets** — that is, the program should describe **how** the organization will **translate its goals and policy commitments into concrete actions** so that environmental objectives and targets are achieved.

To ensure its effectiveness, your environmental management program should define:

- the **responsibilities** for achieving goals *(who will do it?)*
- the **means** for achieving goals *(how will they do it?)*
- the **time frame** for achieving those goals *(when?)*

Keep in mind that your program should be a **dynamic** one. For example, consider modifying your program 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.

At St. Joseph's Mercy Hospital (in Michigan), mercury was in widespread use. The Hospital had a contract with a professional environmental response company to clean up and dispose of any discarded equipment and waste that resulted from mercury spills. Mercury was identified as an environmental aspect during EMS implementation, leading to the development of a Mercury Reduction Initiative. This Initiative is expected to save the Hospital as much as $20,000 per year.

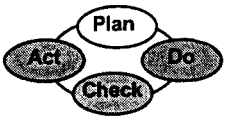
Your action plan need **not** be compiled into a single document. A "**road map**" to several action plans is an acceptable alternative, as long as the key responsibilities, tactical steps, resource needs and schedules are defined adequately in these other documents.

This program should **not** be developed in a vacuum — it should be **coordinated or integrated with other organizational plans, strategies, and budgets.** For example, if you are planning for a major expansion in one of your service operations, then it makes sense to look at the possible environmental issues associated with this operational expansion at the same time.

Hints:

- **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

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"Before, we focused on compliance issues without the benefit of an EMS. Now, we have a strategic plan in place to look beyond legal requirements and save money. It makes my job easier when I can prove my department does not have to be a cost center."

Charlie Saunders, EMS Manager, Pfizer Global Research & Development

responsibilities defined in the program to those who need to know.

- In some cases, your environmental management program 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** (see sample tool, below) 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.



- ***Objectives & Targets***
- ***Structure & Responsibility***
- ***Communication***
- ***Operational Control***
- ***Monitoring & Measurement***

Figure 7: Environmental Management Program (Sample Form)

Objective / Target #1: _____					
Action Items	Priority	Responsibilities	Schedule	Resources Needed	Comments

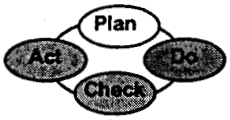


*A full-size copy of this form and another sample form are provided in the **Tool Kit** (see Appendix A).*

☆☆ *POLLUTION PREVENTION* ☆☆

March Coatings operated a de-ionization unit to purify water for its coating process. While effective, the unit required 39,000 pounds of hydrochloric acid to operate. Concerns about potential spills and worker health & safety impacts led the company to replace the de-ionizer with a reverse osmosis unit, which completely eliminated the use of hydrochloric acid.

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Capture the Learning: Environmental Management Programs Worksheet

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 ...	

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2.5 Establishing an Environmental Management Program [ISO 4.3.4]

What the ISO Standard Requires

The Standard requires that the company does what is necessary to actually achieve the objectives and targets it sets. This would include (at a minimum): designating who is responsible for achieving them; and specifying how and when they will be achieved. Also, companies should be sure that environmental project management is also a part of the companies' engineering project management process. That is, if a particular project is related to new product or process development, or new activities and services, the normal project management procedures should be changed to reflect the environmental management program.

Starting Points

Many small companies are used to implementing projects, particularly environmental improvement projects, on an ad-hoc basis. The planning process called for in the ISO standard improves the possibility that planning efforts actually succeed, and result in a measurable change in performance. This also greatly improves the perceived "value added" of the overall EMS to the company. By integrating environmental projects into the companies' existing project engineering and management system (or establishing one as required), environmental projects will achieve the same level of project management attention as other manufacturing process/product improvement efforts.

Implementation Tips

1) Take time to do careful project planning up front. Think through each project, identifying possible obstacles, resource needs, time lines, and deciding who will do what specific tasks.

2) Set up a project management reporting and review system. This can be simply a periodic management review of progress, and problem solving. Remember that the targets you set can (and will) be revised based on your experience. Periodic reality checks help to ensure that you can actually deliver what you thought you could. This review can also assist multiple project managers in resolving conflicts, and in obtaining the necessary resources to bring about success.

3) EMS Linkages: The EMP(s) should be clearly linked to each objective and target. This can easily be shown in the EMP form or table.

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Examples

Most companies used a form of a "Log Sheet" to record the essential information related to the Environmental Management Program (Example 2.5.1).

Example 2.5.1 Environmental Management Program Log Sheet

Project #	EMS-001
Project Name	Solid Waste Reduction
How this relates to our Environmental Policy Commitment	Pollution Prevention Continual Improvement
Objective	Reduce D007 Waste
Target	Reduce the number of 55 Gallon Drums Shipped per year per $100,000 sales, by 10% by 1999
Resources Needed	Outside service to compact drums
Timing	Project started February 1998, immediate 50% reduction in drums shipped out
Project Manager	L. O. and J. H.

Conformance Check

All of the metal finishers met the requirements relating to what should be in each environmental management program: designation of responsibility, means, and time frames by which each objective is to be achieved. An important part of the 4.3.3 environmental management program requirement was often overlooked; amend your program, if needed, in light of new developments or new or modified activities. One procedure stated that a review would take place of the effects of new processes or equipment on the environmental management program but changes to existing processes or equipment were not mentioned.

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EMS Links

When you change your environmental management program, the following parts of your EMS may also be affected and should be reviewed and revised as necessary.

- Environmental aspects; Objectives and targets: The environmental management program is the planning mechanism by which the objectives and targets are achieved. Aspects are one consideration in developing the objectives and targets and each objective and target is required to have an environmental management program.

- Structure and Responsibility: The environmental management program is tied to structure and responsibility in two ways. First, the responsibility for achieving each objective and target must be defined, documented, and communicated. Secondly, management is to provide resources necessary to implement the environmental management program (or as stated in the standard, "resources essential to the implementation and control of the environmental management system.").

- Training, awareness, and competence: The environmental management program is a requirement of the EMS and the roles and responsibilities related to the program should be part of environmental training.

- Monitoring and Measurement: The standard requirement to track performance, operational controls, and conformance with the objectives and targets provides the feedback you need to measure the progress of your environmental management program.

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Chapter 3

Chapter 3: Environmental Operations and Control

- 3.1 Operational Control, Monitoring, and Measurement
- 3.2 Emergency Preparedness and Response
- 3.3 Structure and Responsibility
- 3.4 Training, Awareness and Competency
- 3.5 Communication
- 3.6 EMS Documentation
- 3.7 Document Control and Records

[NOTE: This EMS Guide is laid out sequentially based on a typical implementation action plan. This causes the ISO 14001 Standard sections referenced to occasionally appear out of numerical sequence. This altered sequencing allowed the participating companies to progress through the implementation process with a minimal amount of "back-tracking" between steps. For example, it was difficult for companies to address assignment of Structure and Responsibilities (ISO Section 4.4.1) and to identify needs for Training, Awareness, and Competence (ISO Section 4.4.2) until they had completed development of the required operational procedures and work instructions (ISO Section 4.4.6 and 4.5.1). Adapt your approach to whatever works best in your situation.]

Naval Aviation Depot
CA

ISO 14001 Procedure

Title	Document Effectivity	Status
Environmental Management Program	First Issue Date 01/22/1999 Revision Date 05/05/1999	Issued
EMS Procedure No	**EMSMR**	Rev
EMSP434	Melito M Barrera/NI/NADEP	1

Purpose

To establish and maintain a program for achieving objectives and targets.

Scope

This procedure describes monitoring and reporting on the progress of SEA improvement projects.

Responsible Party	Responsibilities
EMS MR	• Administers the EMP. • Coordinates with the OUMR to identify the key characteristics (i.e., objectives, targets, task descriptions, and point-of-contact) of the SEA improvement projects.
OUMR	• Identifies the key characteristics of the SEA improvement projects on the EMP form. • Manages the SEA improvement projects.
OUM	• Provides the necessary resources and management support for the implementation of the SEA improvement projects.
ESC	• Provides the necessary resources and management support for the implementation of EMS objectives and targets.

PROCEDURE

1. **The OUMR will:**

a. Complete the EMP form identifying the key characteristics of the SEA improvement project(s) and the accomplishment of meeting objectives and targets (see EMSP 433).

b. Review the progress of SEA improvement projects each EMS cycle (see EMSP 46) to determine the continued relevance of the objectives and targets.

- Modifications of an SEA improvement project that result in redefining the objective will cause the cancellation of the EMP form and the creation of a new EMP form to address the new SEA.
- All other modifications (i.e., changes in point-of-contacts, estimated completion dates and additional tasks) will be indicated on a new revision of the existing EMP form.

c. Complete EMP forms and submit them to the OUM for review.

2. The OUM will:

a. Review and accept, disapprove or recommend changes to EMP forms submitted by the OUMR.

3. The EMS MR will:

a. Prepare a summary sheet of objectives and targets for presentation to the ESC (see EMSP 46) and record the minutes of the briefing.

b. Review performance with regard to achieving the objectives and targets at the end of each EMS cycle (see EMSP 46). This information is used as input for identifying EAs for the succeeding EMS cycle (see EMSP 431).

c. Evaluate any deviations to the progress of achieving the objectives and targets with the OUMR. Modifications of objectives resulting in new EMP forms are presented to the ESC.

4. The ESC will:

a. Review objectives and targets and their continuing suitability at least once each EMS cycle (see EMSP 46).

References

ISO 14001:1996, Section 4.3.4

EMSP 431 Environmental Aspects

EMSP 433 Objectives and Targets

EMSP 46 Management Review

EMP form

Guidelines for Completing the EMP Form

Document Edited By:
Form Rev 1.0.2 15 APR 2000

- *A direct link to DEQ's strategic planning and budgeting process;*
- *Appropriate procedures and training; and*
- *Performance measures, self-assessment, and independent assurance reviews.*

Dennis H. Treacy, Director
Virginia Department of Environmental Quality

This Environmental Policy shall be communicated to all employees by the EMS Manager and maintained on DEQ's website by the Public Affairs Manager.

2. Environmental Aspects, Objectives and Targets, and Environmental Management Programs

2.1. Environmental Aspects

Each year, in the month of February, the EMS Program Team (see Structure and Responsibility, §4) shall 1) develop an inventory of DEQ's environmental aspects and impacts, 2) determine which aspects are potentially significant impacts and 3) use this information in establishing environmental objectives and targets for the upcoming fiscal year.

The results of exercising this procedure shall be maintained by the EMS Manager in a document that records the findings of the EMS Program Team, the environmental objectives and targets, the management programs and plans for achieving them, and progress toward achieving environmental objectives and targets.

2.2. Objectives and Targets

Concurrent with its determination in February of each year as to which of DEQ's environmental aspects are potentially significant environmental impacts, the EMS Program Team shall establish environmental objectives and targets for the upcoming fiscal year. These Environmental Objectives and Targets shall be documented and maintained by the EMS Manager.

2.3. Environmental Management Programs

Concurrent with its determination in February of each year as to which of DEQ's environmental aspects are potentially significant environmental impacts and its establishment of Environmental Objectives and Targets, the EMS Program Team shall establish management plans and programs to achieve the environmental objectives and targets for the upcoming fiscal year. These management plans and programs shall include designation of person(s) responsible for their achievement, means and methods of achievement, and timeframes for achievement. These Management Plans and Programs shall be documented and maintained by the EMS Manager.

3. Legal and Other Requirements

In line with DEQ's Environmental Policy commitment to complying *"with all applicable environmental laws and regulations,"* the Director shall require the Director of Administration and each of the Regional Directors to compile archives of relevant environmental laws,

Environmental Management Program - Sample Tool

Objective / Target #1: _____					
Action Items	**Priority**	**Respon-sibilities**	**Schedule**	**Resources Needed**	**Comments**

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Sample Environmental Management Program Form

(Note: Use one form per objective)

Date (_____/_____/_____) **Individual Responsible:**
Environmental Objective:
Related Target(s):
Related Significant Environmental Aspect(s):
Specific Function and/or Department:
Target Date (Month/Year): (_____/_____)
Environmental Management Program: Action Plan
How will this objective be met? (attach additional pages as necessary)
What operational controls might support the achievement of this objective?
How will this objective be tracked? (attach additional pages as necessary)
What resources will be required to achieve this objective? (attach additional pages as necessary)

Adapted from the EPA/NSF guide "Environmental Management Systems: A Guide for Metal Finishers" (December 1998). Available for free download at www.nsf-isr.org.

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32648 e PDF

Structure & Responsibility

4.4.1

Section I

"Structure & Responsibility" from NSF Guide

"Structure & Responsibility" from NSF Metal Finishers Guide

"Roles & Responsibilities" from Colleges and Universities EMS Guide

Section II

Charleston Public Works EMS Structure and Responsibility Procedure

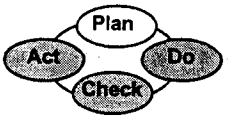
Alumax Implementation and Operation Procedure

Naval Aviation Depot North Island Structure and Responsibility Procedure

Virginia Department of Environmental Quality Structure and Responsibility Statement

Sample Responsibility Matrix

Comments:



Structure and Responsibility

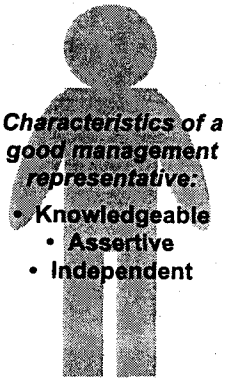
Aligning your resources to succeed

"Resources include human resources and specialized skills, technology, and financial resources."

- ISO 14001

For an EMS to be effective, roles and responsibilities must be clearly defined and communicated. The commitment of all employees is needed for an EMS to live up to its full potential.

Top management plays a key role by **providing resources** needed to implement the EMS. This is one of the most important jobs of top management (see "Finding Resources" on next page). In some organizations, "top management" might be a single individual, while in others it might be a group of people (such as a board of directors).



An effective management system needs an advocate. Thus, top management should **appoint a management representative.** This representative (1) ensures that the EMS is established and implemented; (2) reports on its performance over time; and (3) works with others to modify the EMS as needed. The management representative can be the same person who serves as the project champion (as discussed in Section 3), but this is not mandatory. A business owner, plant or shop manager, or any number of other people might serve as an effective EMS management representative.

More organizational advantages of small business:

- ☑ shorter lines of communication
- ☑ less complex organization
- ☑ limited delegation
- ☑ simpler access to management

Small and medium-sized organizations may have **advantages** over larger ones in structuring their resources for environmental management. Because personnel and other resources are generally more limited in smaller organizations, people often "wear more than one hat" and have experience in performing multiple functions. An individual responsible for environmental management in a smaller organization also might be responsible for quality, health & safety, facilities, or other functions. In such cases, integrating environmental responsibilities with other functions can be greatly simplified.

Getting Started

Look at:

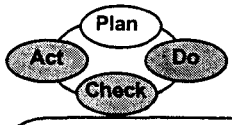
- ☑ Program Scope
- ☑ Environmental Aspects
- ☑ Objectives
- ☑ Previous audits
- ☑ Other systems

Getting Started:

The following questions can help you determine the right organizational structure for environmental management:

- ***What is the scope of our environmental management program?*** What capabilities do we need? Who will help to make the EMS effective? What training or other resources do we need?
- ***What are our significant environmental aspects and compliance needs?*** What operations / activities need to be controlled? Who needs to be involved to ensure that controls are implemented?

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Consider integrating EMS with your existing:

- ☑ information systems
- ☑ purchasing controls
- ☑ quality procedures
- ☑ work instructions
- ☑ training programs
- ☑ communication efforts
- ☑ reporting systems
- ☑ recruitment, appraisal and disciplinary processes

What are the results of previous audits or other assessments? What does this information tell us about the effectiveness of our organizational structure and how it might be improved?

- ***What are the current responsibilities for environmental management?*** How can we enhance ownership of environmental management across the organization? How can other functions support the EMS? (See next page.)
- ***What are our objectives and targets, including those related to compliance and pollution prevention?*** How will the organizational structure help up achieve these goals?
- ***What quality management and / or other existing management systems exist?*** What roles and responsibilities exist in these management systems? Do opportunities for system integration exist?



*See **Appendix C** for information on process mapping*

Consider **flow charting** your existing environmental management activities. This can help you understand how these processes work and the final product can be a great communication and training tool. Flow charts also can be useful to look at processes such as chemical purchasing and distribution, employee training, and preventive maintenance, among others. **Appendix C** provides information on process mapping.



Hints:

- Build **flexibility** into your organizational structure. Recognize that environmental (and other) management needs will change over time.
- **Communicate** to people what their roles are (as well as the roles of others). One tool for communicating these responsibilities is a **responsibility matrix.** (See the **Tool Kit** in Appendix A for an example of such a matrix.)



Appendix A provides a sample responsibility matrix



More information on resources is found in Appendix F of this Guide

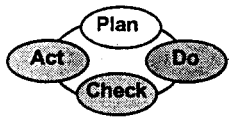
Finding Resources

In most cases, developing and maintaining an EMS will not require large capital outlays. What an EMS will require is **time.** Many smaller organizations find they can make effective use of interns or temporary employees to perform potentially time-consuming EMS development tasks (such as collecting data, drafting procedures, etc.). This allows in-house personnel to focus on more complex EMS development tasks. Also, look for areas where environmental management can support other organizational functions (and vice-versa — see next page).



- ***Objectives & Targets***
- ***Training & Awareness***
- ***Communication***
- ***Management Review***

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How Various Functions Can Support Your EMS

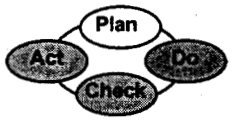
Functions	How They Can Help (Possible Roles)
Purchasing	• Develop and implement controls for chemical / other material purchases
Human Resources	• Define competency requirements and job descriptions for various EMS roles • Train temporary workers and contractors; maintain training records • Integrate environmental management into reward, discipline and appraisal systems
Maintenance	• Implement preventive maintenance program for key equipment • Support identification of environmental aspects
Finance	• 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
Engineering	• Consider environmental impacts of new or modified products and processes • Identify pollution prevention opportunities
Top Management	• Communicate importance of EMS throughout organization • Provide necessary resources • Track and review EMS performance
Quality	• Support document control, records management and employee training efforts • Support integration of environmental and quality management systems
Line Workers	• Provide first-hand knowledge of environmental aspects of their operations • Support training for new employees

For EPA's Performance Track program, organizations must provide appropriate incentives for personnel to meet EMS requirements. See Appendix B for more information.



See the EPA/NSF project report, *Implementing an EMS in Community-Based Organizations* for more ideas on how organizations with limited resources can implement an EMS. Download the report free of charge at www.nsf-isr.org or www.epa.gov.

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Capture the Learning: Structure & Responsibility Worksheet

How do we **define roles, responsibilities and authorities** for environmental management now? Is this process **effective?**	
Who is / should be our EMS **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 ...	

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3.3 Structure and Responsibility [ISO 4.4.1]

What the ISO Standard Requires

The ISO 14001 Standard requires facilities to clearly define, document, and communicate environmental management roles and responsibilities. In particular, one or more person(s) must be designated as the EMS representative, who has the responsibility of making sure that the EMS requirements are established, implemented, and maintained, and for taking the lead in reporting on the performance of the EMS to top management in periodic reviews. Management has the responsibility to provide the necessary resources to make the EMS work, including skilled personnel, technology, and financial resources.

Starting Points

Most of the companies had only one clearly defined role in environmental management—the person(s) responsible for compliance with environmental regulations. Generally, this person was also the designated contact for emergency response, although the actual contact would typically be made through maintenance personnel or shift supervisors. This indicates that it is worthwhile for companies to take the time to clearly identify who is responsible for operations and activities that may have a serious impact on the environment. Companies can also benefit by making sure that everyone knows the key contact people.

Several metal finishers had failed to provide adequate resources (time, technology, and money) to support staff who were assigned responsibility for environmental management (reported in interviews with staff). The scarcest resource mentioned by the metal finishers was time, given that environmental staff typically carry a number of other responsibilities besides environmental management.

Implementation Tips

1) Spell out specific responsibilities in job descriptions for key personnel involved. This should include top management, shift supervisors, and maintenance personnel, in addition to the designated EMS Representative.

2) The EMS Representative does not have to be the Environmental Manager or Engineer for the facility (or the Environment, Health, and Safety Manager). In fact, we found that those facilities who appointed a person with some quality systems background actually made faster

progress in developing and implementing their EMS. This is because the key skill for the EMS Representative is an understanding of the systems-based approach to management, and an ability to work cross-functionally within the organization to get buy-in. Environmental knowledge is another key, of course, but this resource can be obtained from outside of the company as necessary to complete the more technical sections of the EMS (aspect and impact identification, environmental management program, and operational control procedures).

3) Interview shop floor personnel to determine who they currently think is responsible for managing the day to day environmental impacts (including waste hauling, spill cleanup, air emissions). This allows you to check your assumptions about how well informed people are—and to educate as necessary.

Examples

1) To meet reporting requirements under the "Structure and responsibility" section of the standard, the majority of procedures reviewed specified that the Environmental Management Representative was to report to Senior Management or to the EMS Implementation Team. The best examples included a specific time frame for this reporting.

> The Management Representative shall be responsible for reporti ng the performance and continuous improvement strategies to the EMS Grou p on a monthly basis.

2) One procedure emphasized management's critical role in providing resources for the EMS.

> Management provides resources for i mplementation a nd control of the EMS.
>
> The need for more resources is com municated to Senior Management throug h the Environmental Management Representative, Environmental Committee, and department supervi sors.

Conformance Check

The documentation on structure and responsibility provided by the metal finishers was in the form of procedures. While the procedures defined the roles and responsibilities for the EMS, there are other important standard requirements that could not be assessed based on paperwork alone. Review your EMS for the following:

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- Top management (or management) is mentioned in the standard only three times: under policy, management review, and structure and responsibility. One of management's key responsibilities is to provide adequate resources for the EMS. If EMS implementation is repeatedly delayed or the EMS is not being maintained as defined by the organization, management may not be providing adequate resources.

- Be sure responsibilities are communicated throughout your facility. An EMS auditor (internal or external) will interview employees at all levels to determine if they understood the environmental responsibilities of their jobs.

- An auditor of your EMS will also look for evidence of reporting to top management on the EMS performance and how this information was used to make improvements in the EMS.

- Has top management documented their appointment of a specific management representative? This requirement of the standard is often overlooked. The procedures reviewed did describe a position as responsible for EMS development (e.g., EH&S Director, Management Representative) but it was not clear if the procedures were issued by top management. In addition, an auditor of your EMS might note if the EMS representative was high enough in the organization to have the authority to establish, implement, and maintain the EMS.

EMS Links

The structure and responsibility requirements of ISO 14001 pertain to every section of the standard. Roles, responsibilities, and authorities should be defined for each element of the ISO 14001 Standard. A double check for your organization is to look in the Standard where it states, "The organization shall..." and determine who or what group is responsible for developing, maintaining, or revising the particular standard requirement(s). Check to see where that responsibility is

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documented and be sure that responsibility is clearly assigned to an individual. Avoid general responsibility assignments such as:

> Management and administration are responsible for the implementation and maintenance of this [structure and responsibility] procedure and for coordinating and maintaining the procedure on a day-to-day basis.

ELEMENT 3.1

ROLES AND RESPONSIBILITIES

An EMS should establish roles and responsibilities for environmental management. These roles and responsibilities must be clearly and effectively communicated to all employees. In addition, C/U administration should designate an employee who (1) ensures that the EMS is established and implemented; (2) reports on EMS performance over time; and (3) works with others to modify the EMS when necessary.

The size of the C/U and therefore the complexity of the internal structure will have a profound effect on the organization of personnel responsibilities for the EMS. Be cognizant of the size and characteristics of your C/U and plan accordingly when assigning roles and responsibilities. For example, smaller C/Us usually have less hierarchy, more direct lines of communication, and faster decision-making processes. And because staff at smaller C/Us often performs multiple functions, integrating environmental responsibilities with other functions can simplify the EMS structure and minimize use of resources. Medium-sized and large C/Us on the other hand may have significantly more specialized expertise and resources but also more bureaucracy; as a result, they must strive to break down interdepartmental barriers and operate collaboratively to create an efficient and functional EMS.

Implementation: *Procedure 3.1, Roles and Responsibilities*, describes how to assign responsibilities and determine organizational roles for the EMS. The procedure can be implemented, in part, through the Responsibilities Matrix and Organizational Chart. The matrix and chart should be used to plan and assign EMS responsibilities and can also be used to communicate these responsibilities to other people in the C/U. After EMS responsibilities have been assigned, it will be helpful to develop an organizational chart showing responsible employees, lines of communication and reporting, and any hierarchy that may be in place. In addition, an example C/U EMS organization chart has been provided as a possible starting point for developing one for your C/U.

Considerations in assigning and reviewing EMS roles and responsibilities:

- Personnel involved
- Training and resources required
- Results of previous audits
- Improvement of current structure
- Integration with other C/U functions and existing management systems

SAMPLE PROCEDURE ONLY – REVISE AS NEEDED

[C/U Name]	EMS Procedure	3.1
	Effective Date	
	Subject	**Roles and Responsibilities**

Purpose This procedure is used to determine the organizational roles and personnel responsibilities for the [C/U Name] EMS.

Step 1 [C/U Name] Administration will first designate an EMS Manager whose role is to oversee [C/U Name] environmental activities. The EMS Manager and other EMS Participants selected by the EMS Manager are responsible for implementing the EMS.

Step 2 The EMS Manager will develop and assign EMS roles and responsibilities and document them using the Responsibility Matrix and Organizational Chart.

Step 3 The EMS Manager will communicate EMS roles and responsibilities to all employees.

Step 4 The EMS Manager and other EMS Participants will review and update the EMS roles and responsibilities every 12 months.

Step 5 Roles and responsibilities documentation will be retained at the facility for at least 2 years.

Responsible Person: _____

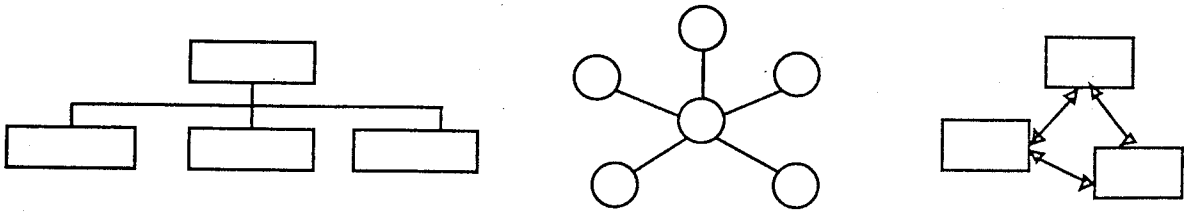
Signature and Date: _____

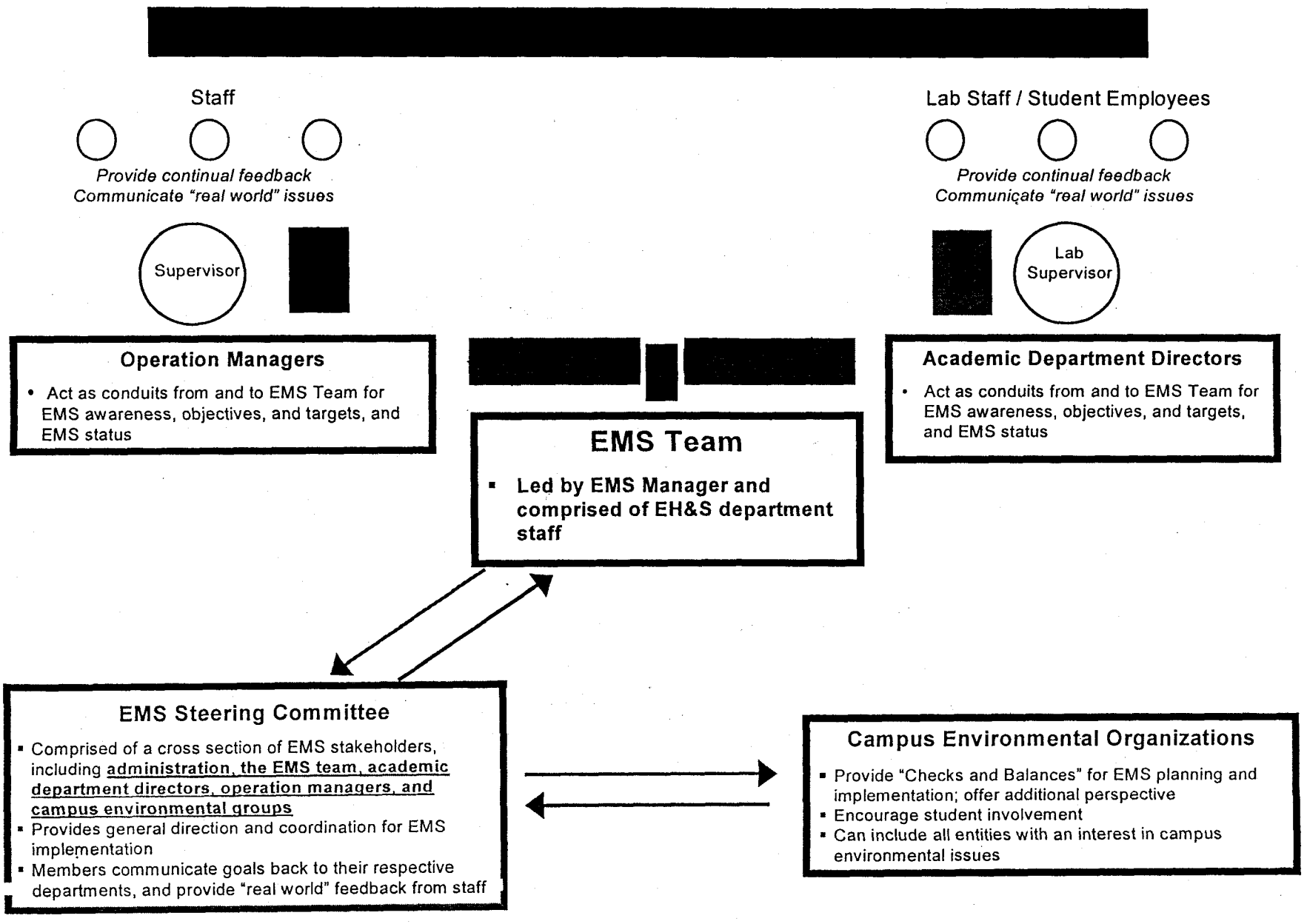
RESPONSIBLITY MATRIX

Facilities and Building Maintenance					Academic Departments				Campus Environmental Groups	
Executive Manager/Director	Zone/Department Managers	Field Supervisors	Field Staff	Student Staff	Department Head	Laboratory Supervisor	Laboratory Staff	Student Staff	Director/President	Members/Student

Management Systems: An Implementation Guide for Small and Medium-sized Organizations, NSF International, 2001

Example Organizational Structure




Staff
Provide continual feedback
Communicate "real world" issues
Supervisor
Lab Staff / Student Employees
Provide continual feedback
Communicate "real world" issues
Lab Supervisor
Operation Managers
• Act as conduits from and to EMS Team for EMS awareness, objectives, and targets, and EMS status
Academic Department Directors
• Act as conduits from and to EMS Team for EMS awareness, objectives, and targets, and EMS status
EMS Team
▪ Led by EMS Manager and comprised of EH&S department staff
EMS Steering Committee
▪ Comprised of a cross section of EMS stakeholders, including administration, the EMS team, academic department directors, operation managers, and campus environmental groups
▪ Provides general direction and coordination for EMS implementation
▪ Members communicate goals back to their respective departments, and provide "real world" feedback from staff
Campus Environmental Organizations
▪ Provide "Checks and Balances" for EMS planning and implementation; offer additional perspective
▪ Encourage student involvement
▪ Can include all entities with an interest in campus environmental issues

CPW ENVIRONMENTAL MANAGEMENT SYSTEM PROCEDURE

The on-line version and secured hardcopy are the controlled documents. The secured hardcopy will be identified by an "Official Document" stamp giving date of distribution. Any and all other documents are uncontrolled. Contact the EMS Program Manager for revision level status.

Effective Date:	**October 1, 2000**	**Page 1 of 2**
Revision: 1	**Identification Number: EMS – 4.4.1**	
Title:	**EMS Structure and Responsibility**	
Prepared By:	**EMS Procedures Subcommittee**	
Reviewed By:	**EMS Management Steering Committee**	
Approved By:	**William E. Koopman Jr., General Manager**	
	John Cook PE, Assistant General Manager	
Date Approved	**August 25, 2000**	

0.0 Requirement **ISO 14001; Sub Clause 4.4.1**

1.0 PURPOSE

This procedure describes how CPW management activities and EMS roles and responsibilities are documented for each associate.

2.0 SCOPE

This procedure applies to all CPW associates.

3.0 DEFINITIONS AND ACRONYMS

Role - The position title of the CPW associate
Responsibility - The duties associated with the title of the employee
Authority - Defined empowerment to require specified tasks and work practices to be conducted
EMS - Environmental Management System

4.0 STRUCTURE and RESPONSIBILITY

CPW executive management establishes the CPW Environmental Policy, participates in the setting of objectives and targets and periodically reviews the performance of the EMS in accordance with the EMS 4.6 Management Review procedure.

4.1 The EMS program manager is responsible for the design, and implementation of the CPW EMS, including the EMS internal audit program.

4.2 Section and department heads and their EMS delegates have authority within their respective departments. This includes approval of the department objectives and targets and periodic review of the performance of the EMS.

Department managers are ultimately accountable for the implementation and performance of the EMS within their department. Department managers play a direct role in establishing and approving objectives and targets, reviewing the performance of the EMS and providing sufficient resources (human, financial and technical). The department managers report periodically to CPW executive management on the environmental performance of their department.

4.3 The EMS Management Steering Committee is responsible for establishing the EMS program, developing the policy and procedures conforming to ISO 14001 requirements, providing guidance and training to departmental EMS implementing committees.

4.4 EMS departmental committees are responsible for developing the EMS program within their department, maintaining EMS documentation and providing training to department associates. The departmental committees have authority over the departmental EMS program.

4.5 For the sake of efficiency, departmental committees may be established to provide EMS assistance to more than one department. Executive management authorizes interdepartmental committees.

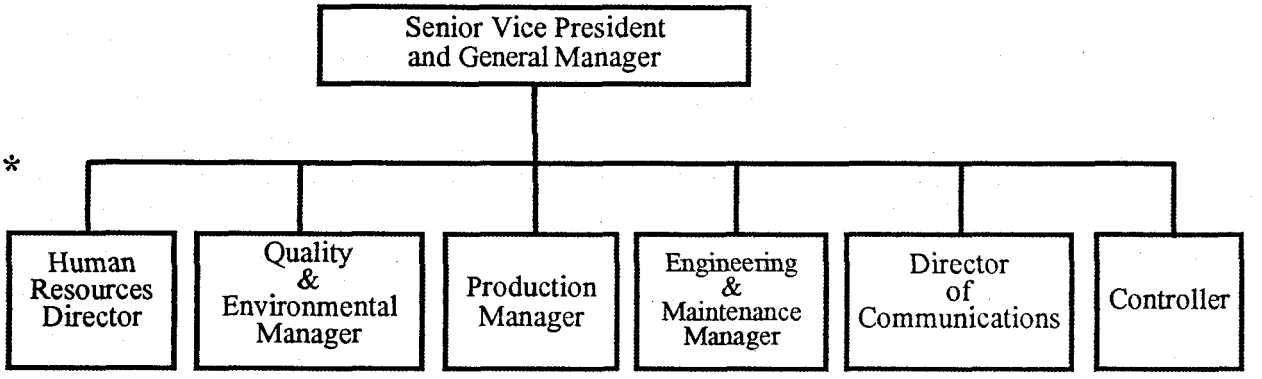
4.6 CPW associates have the responsibility to carry out their job assignments following approved procedures to facilitate effective environmental management. For each level and function that has established environmental objectives and targets, the roles and responsibilities of the associate shall be defined and it shall be documented that the associate has received the appropriate training to accomplish the work assignment.

5.0 RELATED DOCUMENTS

5.1 Environmental Management System (EMS) Manual
5.2 Department Organization Charts
5.3 CPW Personnel Job Descriptions

4.4.1 Structure & Responsibility

Alumax of South Carolina (Mt. Holly) has defined, documented, and communicated the roles, responsibilities, and authority of personnel in order to facilitate effective environmental management. Each relevant management position is shown in the organization chart below. Descriptions are provided for the actual roles, responsibilities, and authority for senior management and other key personnel. The descriptions designate specific responsibility for the provision of resources essential to the implementation and control of the environmental management system.



Sr. Vice President

The Senior Vice President is responsible for development of an environmental policy and approval of resources needed to support the environmental management system (EMS).

Managers

Each manager at Mt. Holly is responsible for overall environmental performance and for providing human, physical (e.g., facilities, equipment, technology) and financial resources essential to implementation and control of the environmental management system for their area of responsibility. Managers shall ensure environmental programs are supported and environmental control and compliance in plant operation is maintained by site management review. Environmental issues shall be reviewed at management review and plant staff meetings. The results of these reviews shall be incorporated into the environmental planning process which includes establishment of objectives and targets.

Environmental Superintendent

The Environmental Superintendent is responsible for developing and implementing an EMS and monitoring/reporting to appropriate regulatory agencies and/or interested parties.

4.4.1 Structure & Responsibility (cont'd)

Quality Engineer

The Quality Engineer has been appointed by top management as the Management Representative for the environmental management system at Mt. Holly. He/she shall have responsibility and authority for:

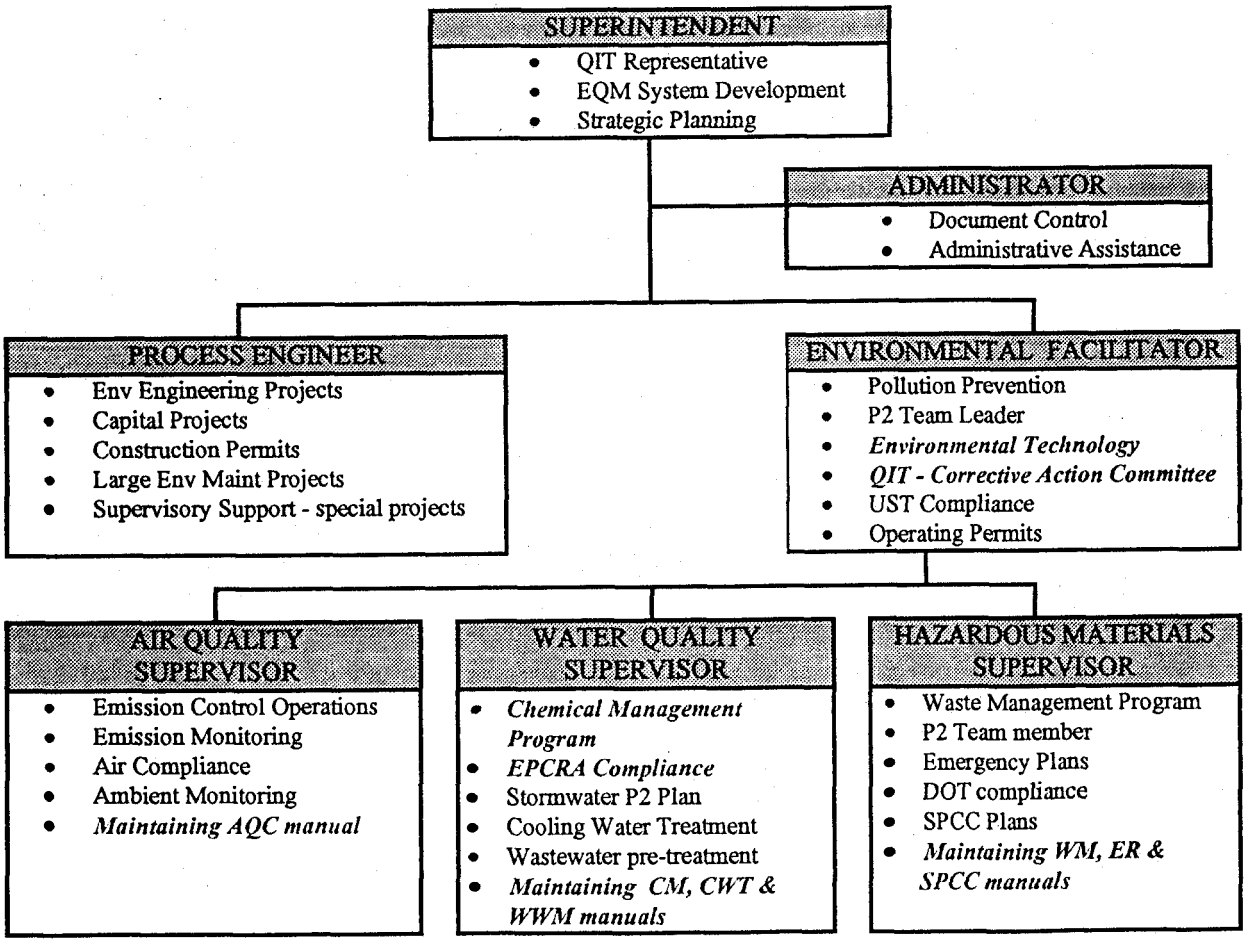
a) ensuring that environmental management system requirements are established, implemented, and maintained in accordance with the ISO 14001 International Standard:

b) reporting on the performance of the environmental management system to top management for review and as a basis for improvement of the environmental management system.

c) providing for maintenance and distribution of the EQM manual.

Environmental Staff

The Environmental Department staff is responsible for development and implementation of environmental management programs within the scope of each members departmental responsibility. Each member is responsible for reporting performance to the Superintendent and other departments' management that is associated with their program. They are also responsible for assuring regulatory compliance (including external reporting) and conducting environmental assessments. The environmental department management organization chart is shown below.



Pollution Prevention Team

The Pollution Prevention (P2) Team is a team formally chartered for the purpose of monitoring environmental system activities in an effort to improve communication among departments and employees, assess the aspects and impacts of the facility, and initiate preventive and corrective action if necessary. The P2 Team is responsible for addressing plant-wide environmental issues in an effort to identify areas for improvement, detect problem situations which may require attention, or initiate corrective action on items not in compliance with known standards or procedures. This team shall approve all actions and activities undertaken by subcommittees derived from P2 membership. This team shall have the responsibility for communicating changes to the environmental management system.

Each department shall have a designated representative which will act as a liaison for communication between the department and the P2 team. *The following table provides a list of the designated areas within the plant that is represented by a member of the P2 team.*

Areas of Responsibility for P2 Membership
(Team Leader)
Warehouse
Cast House
Quality/Lab
Engineering
Environmental
Human Resources
Potline & Potline Services
Maintenance - mechanical & electrical
ISO 14001 Management Representative
Carbon Plant (Green, Baked, Rodded, Cathode Repair)
Purchasing, Traffic, Accounting, MIS, Admin Bldg. & Contractors

A roster of current P2 Team members will be maintained on the plant "Teams" network application.

Members on the P2 Team may serve on an ad-hoc subcommittee if needed to address specific environmental issues necessary to meet the requirements of the environmental system or to perform various tasks as a measure of continuous improvement.

Emergency Response Team

An Emergency Response team shall be formally chartered to prepare the plant for, and provide response to, all conceivable emergencies (fire, confined space rescue, HazMat spill, medical or natural disaster). Team responsibility will include development of contingency plans to minimize potential impact on the environment due to release of hazardous materials in the event of an emergency. The team structure shall be designed to maintain a "shift team" of 10 - 12 members per shift with members representing the major Production areas (Cast House, Potline, Carbon Plant), Maintenance, Safety/Security, Environmental and Industrial Hygiene.

Project & Process Engineers

Project and Process Engineers are responsible for improving plant operations and efficiency through development and implementation of capital projects including purchase, design and replacement of existing equipment and revisions to plant layout.

Controller

The Controller is responsible for developing/ maintaining accounting procedures for tracking costs and benefits of environmental activities and capital expenditures for pollution control. ***The Controller also shepards the Strategic Planning function by directing the plant's strategic planning process to ensure coordinated planning that meets Mt. Holly's long term business needs.***

Director of Communications

The Director of Communications has responsibility for the Purchasing Department. Purchasing is responsible for supporting EMS policies designed to control incoming chemical products, supplies and materials to minimize the quantity and toxicity of chemicals on-site and to minimize waste associated with packaging materials.

Employees

All employees of Alumax of SC have environmental responsibility to support the overall environmental management system. At a minimum each employee is responsible for performing his or her job in accordance to policies and procedures established to control impact on the environment.

Other Resources

Financial - Financial resources to support the EMS are provided through the operating budget process. Systems shall be developed and maintained to track cost and benefits of environmental activities and waste management as well as for costs for pollution control capital projects and pollution abatement.

Physical - Physical resources including equipment and new technology essential to implementation and maintenance of Mt. Holly's environmental policy shall be provided in balance with economic needs. Physical resources are requested by one of the following methods:

a) **CPER** (Capital Project Evaluation Request) - requests are submitted to Engineering for new equipment costing over $15,000.

b) **"Nonrecurring Maintenance Budget Request List"**- in addition to nonrecurring maintenance, modification to upgrade equipment can be included. (Note: If this modification will extend the life of the asset or increase its utilization capability it will be transferred to a capital request). Maintenance Budget Requests are usually required to be submitted in June of each year to Maintenance for approval.

c) **Production Improvement** - operating account (cost center)-5315 shall be used for purchase of equipment (less than $15,000) or modification to upgrade existing physical resources.

4.4.2 Training, Awareness and Competence

Training needs assessments shall be conducted annually by each department manager/superintendent. * A training plan shall be documented as a result of the needs assessment.

Procedures shall be established and maintained to ensure employees are aware of:

a) the importance of conformance with the environmental policy and procedures and with the requirements of the environmental management system;

b) the significant environmental impacts, actual or potential, of their work activities and the environmental benefits of improved personal performance;

c) their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirements of the environmental management system, including emergency preparedness and response requirements;

d) the potential consequences of departure from specified operating procedures.

Training considerations shall include training for employees whose work may create a significant impact on the environment, new employees, temporary employees, contractors, and janitors. These programs must comply with that required by regulations. Procedure MH-EV-S-006 should be referenced to ensure required training is planned.

All employees shall be trained to develop awareness and competency in the following with refresher training provided as needed. When employees change departments, they must be trained on the environmental aspects of their new jobs and the work practices to control environmental impact within 30 days.

- Environmental Management System/ ISO 14000 (general awareness)
- Work practices to control significant environmental aspects
- Waste Minimization / Pollution Prevention
- Emergency Response Awareness

All employees shall be competent to perform tasks which can cause significant environmental impact. Competency will be established on the basis of appropriate education, training and/or experience.

4.4.3 Communication

Internal

Mt. Holly shall establish and maintain the following methods and procedures for communication between the levels and functions:

- P2 TEAM - Pollution Prevention *(P2)* Team members shall be primarily responsible for conducting environmental communications throughout the plant.
- MEETINGS - Routine meetings will be held every two weeks for updating communications between all managers and superintendents in the plant. Team meetings for the*P2* Team will be held according to schedule (about monthly). Pertinent information from these meetings shall be communicated to departmental staff who will pass on information to other departmental employees.
- WRITTEN REPORTS - Written Environmental Reports shall be made monthly and distributed to all Environmental members and management. WasteMin/*P2* Status Reports shall be made monthly and on an annual basis and distributed to department superintendents, P2 Team members, Corporate and other Alumax primary aluminum plants. Annual Environmental Reports which provide a complete account of environmental performance, activities, and regulations shall be distributed to plant management and corporate.
- E-MAIL & NEWS*MONITOR* - Shall be used to communicate plantwide.

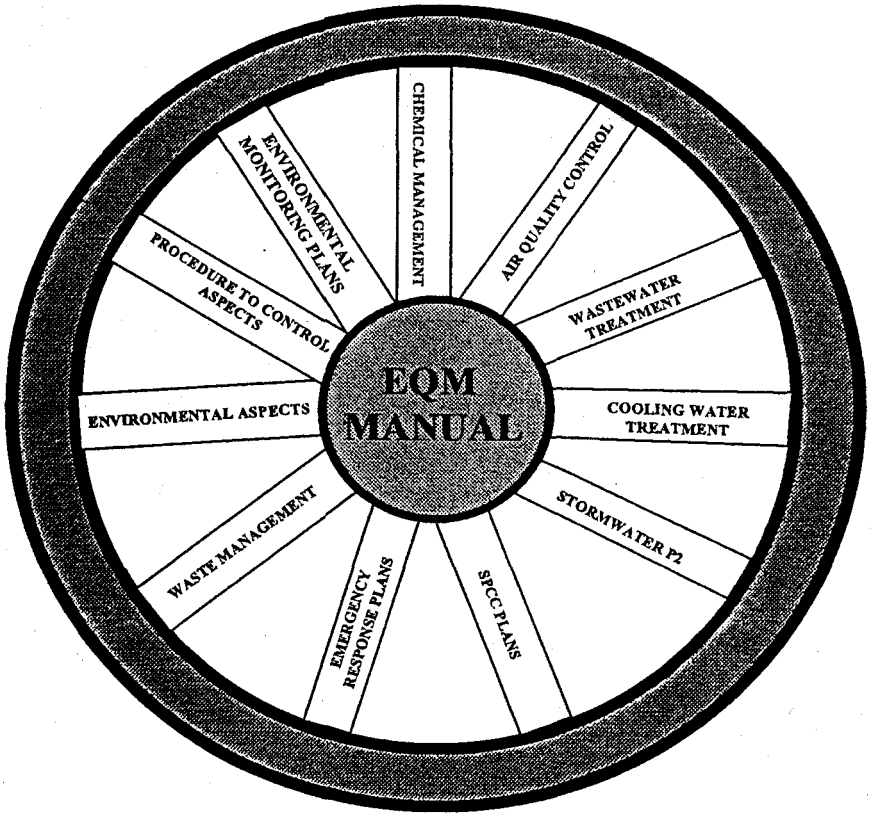
External

The following shall be utilized for communications external to the plant:

- REGULATORY AGENCY - Environmental staff members shall be responsible for maintaining communications on their area of responsibility with DHEC.
- NEWS MEDIA - The Plant Manager or his/her designee shall be responsible for all communications with the news media.
- LEPC - The Hazardous Materials Supervisor is the designated representative to the local emergency planning committee.
- REQUESTS - Requests from the public concerning environmental (with exception to the news media) shall be first directed to either the Quality / Environmental Manager or The Environmental Superintendent. All requests will be evaluated and response provided to the requester either granting their request or explanation of why it will not be granted. These communications * shall be documented in the environmental period report.
- COMMUNITY - External communications shall be made to the community on at least an annual basis to promote environmental awareness and *P2* via the newspaper and by participation in community Earth Day projects such as Kids Who Care "Nature Scope". Consideration shall be given to reporting on the plant's environmental performance for these annual community reports. Environmental presentations and tours will be provided to local school groups upon request, when feasible.

4.4.4 Environmental Management System Documentation

Documentation of the management system shall be accomplished using the Environmental Quality Management (EQM) Manual, specific environmental management program manuals, and departmental procedures. Mt. Holly documentation shall be developed by the Environmental Department in accordance with the Environmental Management System Illustration shown below.



EQM Manual

The design of the EQM Manual shall identify all areas of environmental responsibility and describe the structure and system used to manage these responsibilities. The management system shall be designed to integrate quality standards with sound environmental management practices. The EQM Manual shall be used to establish a standard for documentation and management control.

Environmental Program Manuals

Program manuals shall be developed for the categories of environmental concern listed on the illustration as a supplement to the EQM Manual. Full documentation for each environmental program shall be included within each program management manual. Program manuals shall be designed to be used for program management, operation, training*, information resource, and auditing.

Manual Organization

The Environmental Department environmental management manuals shall be developed and maintained with the following specified documentation.

EQM MANUAL
• Environmental Management System
• Document Control
• Corrective & Preventive Actions
• Management Review
WASTEWATER MANAGEMENT MANUAL
• Sewage Treatment Operation
• Process Wastewater Management
• Spray field requirements (closure)
• Groundwater monitoring
COOLING WATER TREATMENT MANUAL
• Cast House Systems
• Compressor room cooling water system
• Rod Shop cooling water system.
• Green Carbon system
WASTE MANAGEMENT MANUAL
• Asbestos Abatement Program
• Spent Potliner Management Plan
• Drum Management Program
• Solid Waste Management Program
• Used Oil Management Program
• Solvent Management Program
• Waste Minimization Plan
CHEMICAL MANAGEMENT MANUAL
• Chemical Product Accounting Plan
• EPCRA Compliance Plan
• Toxic Use Reduction Plan
• Chemical Storage Plan
• Ozone Depleter Compliance Plan
• Greenhouse Gas Reduction Plan

AIR QUALITY CONTROL MANUAL
• Dry scrubber systems operation
• Dust collector systems operation
• Pot hood maintenance program
• Filter bag quality control program
• Emission Monitoring
• Compliance Reporting
• Ambient Monitoring Plan
STORMWATER P2 PLANS *
• Written Plan in accordance to permit
• Monitoring Plan / procedures
• Annual site assessments & SWPP Revision
SPCC PLANS *
• Spill potential assessment (Petroleum Prod.)
• Spill prevention / control provisions
• Spill contingency plans & procedures
• UST Management Plan
EMERGENCY PREPAREDNESS & RESPONSE PLANS
• RCRA Contingency Plans (hazardous waste)
• OSHA Action Plan (including Evacuation)
• Preparedness & Prevention Plans
• Medical emergency preparedness/ response
• Fire Prevention /Cessation
• HazMat spill/ release response
• Communications

4.4.4 Environmental Management System Documentation (cont'd)

Departments

Each department shall document their significant environmental aspects, identification of the methods used to control impact from each aspect, and procedures used to control impacts.

4.4.5 Document Control

All departments shall follow the Mt. Holly Quality System guidelines established for plantwide document control. Specific requirements shall be maintained in the Mt. Holly Quality Assurance Manual.

4.4.6 Operational Control

Operations and activities associated with the identified significant environmental aspects (SEA) shall be identified. Each department shall plan these activities, including maintenance, in order to ensure they are carried out under specified conditions by:

a) establishing & maintaining documented standard procedures to cover situations where their absence could lead to deviations from the environmental policy, objectives and targets;
b) stipulating operating criteria in the procedures;
c) establishing & maintaining procedures related to the SEA of supplies and services used by the plant and communicating relevant procedures and requirements to suppliers and contractors.

4.4.7 Emergency Preparedness and Response

Procedures shall be established and maintained at Mt. Holly for Emergency Preparedness and Response. The procedures will identify the potential for accidents and emergency situations and the corresponding response. The procedures shall also consider the prevention and mitigation of any environmental impacts associated with accidents or emergency situations.

Procedures developed to encompass all departments at Mt. Holly shall be considered "plant" procedures and shall be the responsibility of the Emergency Preparedness and Response program manager. The Emergency Preparedness and Response program manager shall be assigned to the Environmental Department.

All Emergency Preparedness and Response procedures shall be maintained in the Emergency Preparedness and Response Plans manual. Revisions to this manual and communication of the revisions will be the responsibility of the Emergency Preparedness and Response program manager. This manual shall be made available to all plant personnel.

Additional procedures shall be established and maintained at the department level for Emergency Evacuation Plans and Tornado Preparedness Plans. Each department manager/superintendent shall assess the need for other department specific procedures and coordinate the development of procedures with the Emergency Preparedness and Response program manager to ensure consistency and adequacy with plant policy and/or regulatory requirements.

Emergency Preparedness and Response procedures shall be periodically tested, where practical. Procedures shall be reviewed after the occurrence of accidents or emergency situations and revised where necessary.

SECTION: 4.5	CHECKING AND CORRECTIVE ACTION	PAGE: 1 of 3
WRITTEN BY: C. Kirkland	REVISED BY: *P2 Team Subcommittee*	REVIEWED BY: *P2 Team*
DATE WRITTEN: 06/10/96	DATE REVISED: *3-3-97*	DATE REVIEWED *3-13-97*
REV. NO.: *2*	APPROVED BY: *Paul Campbell*	DATE APPROVED: *3-14-97*

4.5.1 Monitoring and Measurement

A system shall be established for measuring and monitoring actual performance against Mt. Holly's environmental objectives. Each department shall ensure records are maintained or reviewed on a regular basis to track key indicators of performance to achieve its environmental objectives.

The Environmental Department shall establish procedures for each environmental management program which shall summarize all relative monitoring, including compliance monitoring specified in environmental permit conditions. In addition to these monitoring procedures each environmental management program shall develop and maintain documented procedures for other system monitoring checks to assure proper operation and/or objectives.

Monitoring Equipment and Records

Monitoring equipment shall be calibrated and maintained and records of this process retained in accordance to Mt. Holly's Quality System (section 4.11 of the Quality manual). Each department utilizing inspection, measuring, and test equipment shall:

a) Determine the measurements to be made and the accuracy required, and select the appropriate equipment that is capable of the necessary accuracy and precision.

b) Identify, calibrate and adjust prior to use or at a prescribed interval against certified equipment with a known, valid relationship to national standards, their equivalents or documented equivalents when no national standard exists.

c) Define the process employed for the calibration of equipment, including details of equipment type, unique identification, location, frequency of checks, check method, acceptance criteria, and the action to be taken when results are unsatisfactory.

d) Identify critical inspection, measuring , and test equipment affecting the quality of cast product with a suitable indicator or approved identification record to show the calibration status.

e) Maintain calibration records for each measuring device. These records are to include date of calibration and person performing adjustments. Each department is responsible for maintaining its records. (Records may be incorporated into a computerized preventive maintenance or work order program.) Records are to be kept in accordance with Section 4.16 of the QA manual - Record Retention Requirements.

Naval Aviation Depot, CA

ISO 14001 Procedure

Title	Document Effectivity	Status
Structure and Responsibility	First Issue Date 01/22/1999 Revision Date 05/03/1999	Issued
EMS Procedure No	**EMSMR**	Rev
EMSP441	Melito M Barrera/NI/NADEP	2

Purpose

To establish structure, responsibility and accountability for the operation and maintenance of the EMS.

Scope

This procedure covers the roles internal to the NADEP organization associated with the operation and maintenance of the EMS.

Responsible Party	Responsibilities
EMS MR	• Ensures that EMS procedures are established, implemented and maintained in accordance with the most current version of ISO 14001 and other NADEP EMS objectives. • Ensures that the Environmental Policy is made available to NADEP employees and other interested parties.
OUMR	• Ensures that EMS requirements for the OU are implemented and maintained.
OUM	• Appoints an OUMR to act as the OU representative and point-of-contact for EMS activities. • Approves objectives and targets for the OU.
EPO	• Reports overall environmental compliance program status to the EMS. • Assigns roles and responsibilities for ER&P. • Chairs and participates in the EIT.
ESC	• Ensures that resources essential to the implementation and management of the EMS are provided. • Conducts management review of the EMS (see EMSP 46). • Ensures that the Environmental Policy is shared with stakeholders, customers, neighbors and others during the course of regular duties.
ITSM	• Provides hardware and software support as needed to support the EMS.
NADEP Base Operations Manager	• Appoints EMS MR(s) to administer the EMS.
EIT	• Meets at least once each EMS cycle (see EMSP 46) to evaluate

	proposed SEA improvement projects (see EMSP 431).
All NADEP Employees	• Practice prevention of pollution whenever and wherever possible. • Adhere to applicable environmental legislative, regulatory, permit, and other requirements. • Have knowledge of the Environmental Policy. • Utilize, develop and produces products that minimize environmental impacts to the extent economically and technologically feasible within the parameters of business operations and imperatives.

PROCEDURE

1. The EPO will:

a. Manage an environmental compliance program to address relevant environmental legislative, regulatory, permit and other requirements.

b. Manage a pollution prevention program. The pollution prevention program personnel shall participate in the EIT.

c. Support EMS implementation efforts by providing environmental expertise and resources.

2. The EMS MR will:

a. Ensure that the Environmental Policy is available on the NADEP Intranet.

b. Ensure the EMS Manual is maintained and updated on the DCRS.

c. Coordinate an internal EMS audit once each EMS cycle (see EMSP 46) to ascertain the performance of the EMS.

d. Accept objectives and targets for implementation that meet EMS conditions and procedures.

e. Represent the organization and coordinate logistics during external EMS audits.

f. Delegate responsibilities, as needed, to represent the EMS MR in order to facilitate timely accomplishment of EMS MR duties, and record the act of delegation on an Internal Communication form.

3. The OUM will:

a. Appoint an employee of the OU to be OUMR, and list the collateral duties of the position.

b. Approve objectives and targets on EMP forms.

4. The OUMR will:

a. Review the EAs once each EMS cycle (see EMSP 46).

b. Coordinate the selection of objectives and targets and how they will be accomplished.

5. The ESC will:

a. Ensure that the organization considers the EMS in the preparation of official bids, advertisements and other relevant documents.

6. The NADEP Commanding Officer will:

a. Sign the Environmental Policy.

7. General Guidance:

a. For the purposes of the EMS, the ESC will be considered to consist of the Commanding Officer, the Executive Officer, the Production Officer, the Production Manager and the Plant Manager. A quorum is any three.

References

ISO 14001:1996, Section 4.4.1

EMSP 431 Environmental Aspects

EMSP 46 Management Review

Document Edited By:
Form Rev 1.0.2 15 APR 2000

regulations, ordinances, and other requirements[1] applicable to the people, activities, and facilities under their control and forward them to the Manager of Legislative Affairs in the Division of Policy and Legislation.

The Manager of Legislative Affairs shall maintain this archive of relevant environmental laws, regulations, ordinances, and other requirements in accordance with the Documentation, Document Control, and Records requirements of this manual.

The Manager of Legislative Affairs shall continually monitor and review selected sources of information for new legislation proposed in the Congress of the United States and the Virginia Legislature, and for new regulations and changes proposed by the U.S. Environmental Protection Agency, the Virginia DEQ, and other federal and state agencies, applicable to the people, activities, and facilities of the DEQ, and shall forward such information to the Director of Administration and the Regional Directors, as appropriate.

The Regional Directors shall continually monitor and review selected sources of information for new environmental ordinances and changes proposed by the municipalities within their regions and shall forward such information to the Manager of Legislative Affairs.

The Environmental Manager shall periodically monitor and review identified other requirements to determine their ongoing consistency with DEQ's Environmental Policy and shall apprise the Director of Administration and/or Regional Directors of any new requirements or conflicts brought about by changes in other requirements.

The Director of Administration and each of the Regional Directors, shall at least annually

- Determine which laws, regulations, ordinances, and other requirements their area of DEQ is *prima facie* in compliance with;
- Determine which laws, regulations and other requirements their area of DEQ is *prima facie* not in compliance with; and
- Establish management plans to achieve full compliance.

These management plans shall be submitted to the Chief Deputy who shall ensure that they are effectively carried out.

4. Structure and Responsibility

The EMS Program Team, a permanent program team with members appointed by the Director of Administration and the Regional Managers and with at least three representatives from the Executive Management Team (EMT), shall be responsible for establishing and maintaining the EMS and ensuring its conformance with ISO 14001 and DEQ's E^3 Program.

[1] Other requirements are those charters, principles, guidelines, codes of conduct, or by-laws of organizations that DEQ supports or is affiliated with in any way as well as the requirements imposed by federal grants.

The EMS Manager[2] shall chair the EMS Program Team, ensure the day-to-day maintenance of the EMS, and be accountable to the Director for the performance of the EMS.

The Director and the EMT shall be responsible for providing the resources essential to the implementation and control of the EMS.

A Management Review Team, comprised of the Director and members of the EMT, shall annually in November review the EMS for suitability, adequacy, and effectiveness.

5. Training, Awareness, and Competence

5.1. General Awareness Training

All DEQ employees shall receive general awareness EMS training. In the initiation of the EMS during 2001, Director of the Office of Pollution Prevention shall prepare a core general awareness training package and deliver this training, with the assistance of other EMS Program Team members, to all of DEQ's approximately 900 employees. The general awareness training subjects shall include the Environmental Policy, the potentially significant environmental impacts, the objectives and targets, and employees' roles and responsibilities in conforming with the requirements of the EMS.

Thereafter, the DEQ Training Manager shall ensure that EMS general awareness training shall be embedded in the overall DEQ training curriculum being developed by the DEQ Training Committee.

5.2. Significant Impact Training

Concurrent with its determination in February of each year as to which of DEQ's environmental aspects are potentially significant environmental impacts, the EMS Program Team shall identify the training needs of personnel whose work can cause a significant impact on the environment, determine the criteria for personnel competence, and recommend timeframes for delivery of training to the DEQ's Training Committee. These training needs shall become a part of the Environmental Objectives and Targets for the upcoming fiscal year.

The Training Committee shall determine the means and methods for delivery of this significant environmental impact training subject to DEQ's overall mission requirements.

5.3. Training Records

Records of training related to the EMS shall be established and maintained by the DEQ's Training Manager in accordance with Virginia's record retention policy for state agencies.

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[2] The EMS Manager responsibility shall be carried out by the Director of Pollution Prevention & Compliance Assistance (Lead), Director of Enforcement Coordination, Director of Administration, and Director of General Services.

Responsibility Matrix

Legend:
L = Lead Role
S = Supporting Role

	Plant M'gr	EHS M'gr	HR M'gr	Maintenance	Purchasing / Materials	Engineering	Production Supervisor(s)	Finance	EMS Mg't Rep.	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		
Maintain EMS records (training, etc.)		L								
Coordinate EMS document control efforts					S				L	

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Training & Awareness

4.4.2

Section I

"Training, Awareness, & Competency" from NSF Guide

"Building Organizational Support" from EPA IEMS Guide

"Training, Awareness, & Competency" from NSF Metal Finishers Guide

"Training" from Colleges and Universities EMS Guide

Section II

Charleston Public Works Training, Awareness, & Competency Procedure

Naval Aviation Depot North Island Training, Awareness, & Competency Procedure

University of Missouri - Rolla Training Programs for EMS

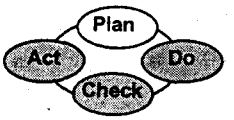
Virginia Department of Environmental Quality Training, Awareness, & Competency Statement

Sample EMS Training Log

KY P2 Center Training Guide

DPPEA's Gov Course Training Schedule

Comments:



Training, Awareness and Competency

Building internal capabilities



Implementing and maintaining an EMS involves <u>everyone</u>

Here are two excellent reasons for training employees about environmental management and your EMS:

- Every employee can have potential **impacts** on the environment, and
- Any employee can have **good ideas** about how to improve environmental management efforts.

Each person and function within your organization can play a role in environmental management. For this reason, your training program should cast a wide net. Every employee and manager 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 <u>not</u> following EMS requirements (such as spill, releases, fines or other penalties).

Reasons for <u>Training</u>:

- ☑ motivation
- ☑ awareness
- ☑ commitment
- ☑ skills / capability
- ☑ compliance
- ☑ performance

All personnel should receive <u>appropriate</u> training. Such 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.



An example of a trainin log is provided in the Tool Kit (see Appendix A)

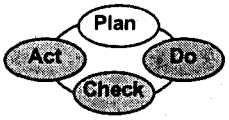
Getting Started:

- A critical first step in developing your training program is **assessing your training and skill needs.** In assessing these needs, you should consider both **general** and **specific** needs (e.g., "What EMS procedures affect Joe's daily work and what happens if they aren't followed?" "What environmental impacts might Joe's work cause?" "What broader understanding of environmental issues and our EMS does Joe need?")
- Look at the **training you conduct already**, for compliance with environmental and health and safety regulations and other purposes. You may find that your existing training efforts go a long way towards satisfying the requirements for the EMS. Competence might be established on the basis of regulatory-required training, in some instances.



- ***Environmental Aspects***
- ***Legal/Other Requirements***
- ***Structure & Responsibility***
- ***Operational Control***
- ***Records***

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Milan Screw Products found that it could provide a great deal of its training during "brown bag" lunches, during which employees bring their lunches, participate in a training session, and remain "on the clock" for the lunch period.

Key Steps in Developing a Training Program

Step 1:	Assess training needs & requirements
Step 2:	Define training objectives
Step 3:	Select suitable methods and materials
Step 4:	Prepare training plan (who, what, when, where, how)
Step 5:	Conduct training
Step 6:	Track training (and maintain records)
Step 7:	Evaluate training effectiveness
Step 8:	Improve training program (as needed)



Hints:

- Because of the level of effort involved in training, this is one EMS element where you don't want to start from scratch. Many employees may be qualified on the basis of their experience and previous training. (Keep in mind that all training should be documented.) Since some employees might require training on how to operate equipment safely, **on-the-job training** certainly can play an important role. **Computer-based training** also may be an option, especially for employees who spend much of their time in the field.

- **Plan and schedule** training opportunities carefully. While finding enough time for training can be a challenge, you might find creative ways to make "more time" (see "tip", above left). Use safety meetings, staff meetings, and tool box meetings to provide training and reinforce key messages.

- New employees can pose a significant training challenge. Consider developing an EMS training package for **new employee orientation**. Even better, videotape one of your current EMS training courses to show to new employees.

- In reviewing training needs, don't forget to consider the qualifications and training needs of your **environmental manager** and your **trainers.** Professional certification programs may be appropriate for certain functions.

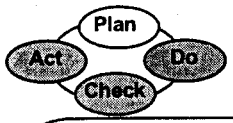
- If the organization uses **temporary or contract workers**, assess their training needs as well.

- Factor EMS skills requirements into your **recruiting, selection**, and new employee **orientation** processes.

Training Resources:

- ☑ internal trainers / experts
- ☑ consultants
- ☑ community colleges
- ☑ vendors / suppliers
- ☑ customers
- ☑ technical / trade / business associations
- ☑ self-study or study groups
- ☑ training consortia (teaming with other local companies)
- ☑ computer-based training

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When Training Might Be Needed:

- ☑ New employee is hired
- ☑ Employee is transferred to a new job
- ☑ Individual doesn't follow procedure / instruction
- ☑ Procedures are changed
- ☑ New process, material or equipment is introduces
- ☑ Company changes objectives and/or targets
- ☑ New regulation affects organization's activities
- ☑ Job performance must be improved

- Establishing **competency** for various tasks can be a challenge. Competency criteria for jobs that can cause significant environmental impacts should be as objective as possible.

  One informal method for assessing competency is to question employees in critical functions as to how they perform various aspects of their jobs (e.g., "Show me how you..."). Use responses to determine whether they have the requisite skills and understanding to perform the job safely. This can help you gauge whether additional training might be needed.

- Consider visual **"job aids"** to supplement training or help establish competence. Examples of job aids include written or pictorial job procedures, decision tables or flow charts posted at the workstation.

- Finally, some organizations have been successful in **blending environmental awareness training into existing safety training** programs. This can be particularly effective where safety training is mandated (i.e., by regulation or other organizational requirements) and has strong management support.

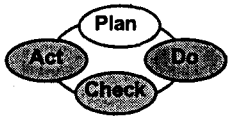
A Few Thoughts About Adult Learning

- Adults need the opportunity to integrate new ideas with what they already know.
- Information that conflicts sharply with existing beliefs or has little conceptual overlap with what is already known is acquired more slowly.
- Adults prefer self-directed learning and want to have a hand in shaping the training program.
- Adults have expectations. It is important to clarify these up-front.
- Adults prefer active participation to straight lecture.

- Adapted from "Adults Learning: What Do We Know For Sure" (Training Magazine, June 1995)

For EPA's Performance Track, organizations must provide specific training for employees whose responsibilities relate directly to achieving objectives and targets and legal compliance.
See Appendix B for more information.

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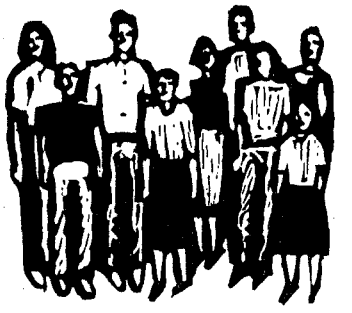


Capture the Learning: Training, Awareness & Competence Worksheet

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 ...	

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MODULE 8: BUILDING ORGANIZATIONAL SUPPORT



Effective organizational support is important to achieving long term success for your IEMS. This module will cover training, documentation, stakeholders and communication.

Training to Get the Job Done

It's very important that people receive the training needed to get work done in a way that is consistent with your objectives. Training is needed both in technical work and for general awareness on the part of all employees. The following are some examples of areas where training is needed:

- legal requirements,
- ability to recognize new problems,
- technical work 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 IEMS and its objectives

In addition to environmental or worker health and safety training that your company may currently carry out, you will have specific training requirements associated with significant environmental aspect operational controls, as your IEMS develops. Module 6 addressed the training for that phase of your

☞ **Tip**

Don't overlook the need for on-going training when experiencing employee turn-over. Be sure that new employees are trained soon after they arrive.

IEMS. Training plans developed during completion of that module should be integrated with the training identified in this module.

Go through the Action Steps listed below and use Worksheet 8-1 to help you identify, plan for and track the training needed to assist in developing and putting your IEMS in place. 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 IEMS.

Action Steps

1. Identify all job functions that affect the environment. Small companies may wish to identify individuals. Identify who is responsible for employee health and safety.

2. Identify the training and type of training these people currently receive that relates to environmental, including health and safety, concerns.

3. Determine if IEMS education could be included in this training or whether there should be special IEMS training, at least in the beginning.

4. Identify training materials or programs available outside your company. Some places to check include:

- Trade Associations
- Small Business Association
- EPA materials
- State Department of Environmental Protection
- Suppliers
- Certified Contractors

Worksheet 8-1: Training Plan

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

Documenting Your Work

When undertaking a new activity like IEMS development, documenting discussions, plans, targets, and programs is crucial. Documentation ensures that no information is lost, and lets you track your performance. Much of this documentation will become the content for your company's IEMS Manual. The companion document to this guide, the *Company Manual Template*, provides a template for your own documentation development. Documentation is important to the success of your IEMS for several reasons:

- Word-of-mouth information is rarely communicated consistently, whereas written information is more likely to be constant from person to person and over time.
- Creating documentation helps you assess the progress of your IEMS. Some inconsistencies show up only as you commit your ideas to paper, and having a record allows you to check on progress and evaluate results.
- Documentation is vital to maintaining consistency in an IEMS over time and from department to department. In most companies, change is a fact of life: new products are developed, the company grows, employees change positions or leave the company. Accurate documentation will make it much easier to maintain an effective and flexible IEMS during these changes.

Resource

Review the *Company Manual Template* for sample documentation to help you develop your own IEMS Manual.



Experience has proven the value of documenting meetings, decisions, and study results, and of making that documentation accessible to those who need it.

What is Documentation?

The term "documentation" has many different interpretations. The term can refer to any or all of the following:

- instructions for doing something;
- records of what was done;
- policies developed;
- printed matter that is given or sent to clients, regulatory agencies, customers, and the public; and
- any electronic copy of the items above.

How a company interprets "documentation" will depend on its particular experience. For example, documentation could include environmental impact statements, process manuals, or even the local newspaper that reports your company's activities. Other examples might include environmental training records and OSHA manuals. All of the work completed to develop your IEMS also provides documentation.

☞ Tip

Documentation is usually the single most overlooked administrative procedure in most companies, but it can play a vital role in EMS development. Determining what you need from your documents, both for future reference and to teach procedures to others, will help you understand the overall needs that you want your IEMS process to meet.

How to Develop Your Documentation

The basic steps in preparing IEMS 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,

☞ Tip

Remember that you will not finish most of the modules in this Guide the first time through. You will probably overlook items that will be useful for your IEMS documentation during your first search. Simply add items as you think of them later in the process. Whoever is in charge of documentation will therefore need to plan for later additions.

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 companies use the same format for all their documents. An example of existing documentation might be a quality plan or tracking reports.

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

You will probably have to compromise in producing documentation that meets your needs while also meeting your budget. Here are some questions to help you determine what fits your needs:

- How can you extend those 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 format for all documents.

Before developing your IEMS documents, plan the format (document and page appearance) for the documents to be created. If a company standard exists, use it. If not, the need for IEMS 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!

Step 4: Prototype each document.

Prototyping means visualizing what you will need in the document and creating an outline for it before you actually have information to fill in. This practice is useful not only for document preparation, but for the IEMS process as a whole. As you visualize what you will need in the document, you will gain understanding about what you will need from the process of developing your IEMS. It's a way

of "outlining" your IEMS process as well as designing documents.

Who should do the prototyping? The best people to do this are the people who will use the document. Involving them in the process gives document users the power to develop documents they will actually use – effective documents.

The following questions will help your "prototypers" design documents. Consider these questions for each document you identify as necessary for your company.

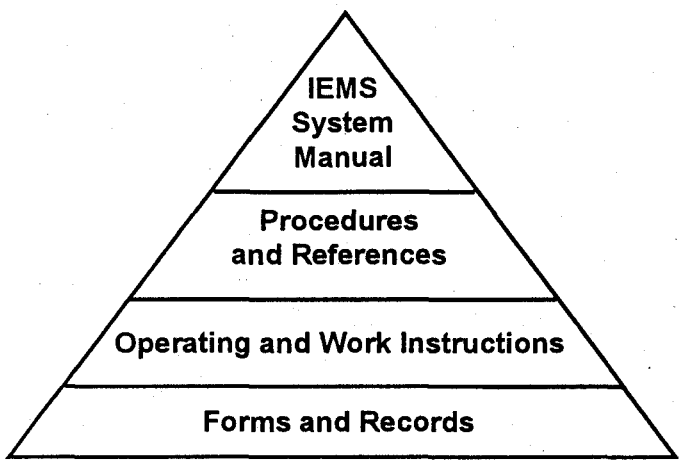
- What is the document's purpose?
- Who will use it, and how will they use it?
- How long should the document be?
- What must be included in the document? Which information is most critical?
- Is it process-focused? Process focus rather than regulation- or program-focus helps people who use the documents to better understand how their jobs fit into the rest of the company functions.
- How is the information best arranged? Will the user read sequentially or randomly?

Example: A Tiered Documentation System

The tiered documentation system consists of four "levels" of documents. The system can be shown as a pyramid with the environmental management system manual at the top and

records at the bottom (see Figure 8-a).

Figure 8-a. Documentation Levels



The pyramid shape illustrates a hierarchy in which the amount of detail, degree of specificity, and number of pages all increase as you progress from the top to the bottom of the figure.

Creating an Outline for the Process

It will be helpful at this point to develop some idea of what your IEMS documentation will look like, and thereby determine the work needed to fill it in. Doing so will help to plan the development of your IEMS. Create an outline for the process of developing your IEMS and your Company Manual or other form of documentation that suits your company. What and how much documentation you include depends upon your company's needs. The following outlines a sample Company Manual:

1. Environmental Policy
2. Environmental Action Responsibilities Assignments
3. Environmental Documents and Their Location
4. Identification of Environmental Aspects
5. Identification of Legal Requirements
6. Identification of Significant Environmental Aspects
7. Development of Objectives, Targets, and Action Plans
8. Conducting an Alternatives Evaluation
9. Development of Operational Controls
10. Environmental Training (Awareness and Task-Specific)
11. Emergency Preparedness
12. Review of New Products and Processes
13. Documentation and Document Control
14. Communication with External Stakeholders
15. Conducting a Compliance Assessment
16. Conducting an Internal Assessment
17. Taking Corrective Action
18. Management Review

The actual content of your outline will be filled in as you proceed to develop your IEMS.

Resource

Take a look at the accompanying *Company Manual Template* for sample procedures and formats to help you document important components of your IEMS.

Document Control

Documents must be easy to find and kept up to date. Consider the following points regarding your document control. Two worksheets follow this section. Worksheet 8-

2 will help you develop documents and Worksheet 8-3 will help you manage your documents once they have been created.

Sound document management ensures that:

- they can be located;
- they are periodically reviewed, revised as necessary, and approved for adequacy by authorized personnel;
- the current versions of relevant documents are available at all locations where operations essential to the effective functioning of the system are performed;
- obsolete documents are promptly removed from all points of issue and points of use, or are otherwise assured against unintended use; and
- any obsolete documents retained for legal and/or knowledge preservation purposes are suitably identified.

Worksheet 8-2: 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:					

Corresponds to CS–2 of the *Company Manual Template.*

Worksheet 8-3: Document Control

Document	Who Will Use It	Permanent Location	Periodic Review Schedule/ Who	When Can Be Destroyed
			/	
			/	
			/	
			/	
			/	

Contact Person: Date Completed:

Working with Stakeholders

Stakeholders are anyone who has a stake in your company's environmental performance. Stakeholders can play an important role in helping your company develop an IEMS. Employees have strong stakeholder interest in your company and can provide strong support for IEMS development. Customers, suppliers, and neighbors can provide useful input. In addition, establishing partnerships with trade associations, suppliers, professional associations, and community colleges can be very helpful in developing parts of your IEMS. This section addresses the kind of stakeholders you may wish to include in the process and the potential benefits of including stakeholders. While involvement of employees is critical to the success of your IEMS, how far you proceed with including additional stakeholders is your decision.



The DfE Program has found that including a variety of stakeholders in a project provides proven benefits. DfE stakeholders include: industry, government, labor, environmental groups, and others. Their inclusion ensures both a mix of viewpoints and a wealth of different experience and training that contribute to a project. This level and breadth of stakeholders may not be available to a small company, but opening your IEMS planning process to a variety of stakeholders will improve results.

Stakeholder Roles

Consider why you would want to include internal and external stakeholders and what roles they can play. Before engaging stakeholders, be clear on what you expect their role to be. What do you want from them? What do you intend to tell them? Consider the following:

- Internal stakeholder (e.g., employee) participation can facilitate implementation of environmental projects as employees "take ownership" of the IEMS process and the process changes it may bring;

- Different stakeholders bring useful perspectives to identifying environmental issues, often identifying issues that might otherwise have been overlooked;
- Participation by all types of stakeholders can add credibility, transparency and value to your IEMS;
- Involving external stakeholders can help them understand your business operating constraints;
- Sometimes being an environmental leader can gain customer recognition and loyalty, and involving customers in your IEMS helps them recognize your leadership.
- Forming partnerships with customers and suppliers can help to identify shared concerns and ways to cooperate to resolve them. There may be ways that your company can help your customers meet their environmental management needs. Forming partnerships with suppliers can help your company obtain important information and may help you meet your IEMS goals.

☞ **Tip**

Working together with your customers to identify common needs in managing environmental concerns can help to build long term relationships.

Identifying Stakeholders

Almost every organization will have a wide array of internal and external groups that may be interested in and helpful partners to that organization. These groups will not be homogenous. Each will have its own priorities and perspectives, and each will have something different to contribute in support of your IEMS.

The following list provides types of stakeholders:

Internal Stakeholders

- Employees
- Shareholders
- Customers
- Suppliers
- Investors & Insurers
- Trading Partners

External Stakeholders

- Neighbors
- Community
- Organizations
- Environmental Groups
- Larger Companies
- The Media
- The Public
- Local Government

You may want to start with those stakeholders who have expressed interest in your operations. If you wish additional input, you can contact the following sources in your effort to locate suitable stakeholders:

- ask your organization's own employees, including plant/site managers and public relations personnel;
- contact local officials for suggestions;
- contact a local planning agency for suggestions;
- contact local schools, community colleges, or

☞ Tip

Remember, your stakeholders' concerns may be very different from what you expect, and even less difficult to resolve than you may think. The only way to find out is to talk with them.

universities; or

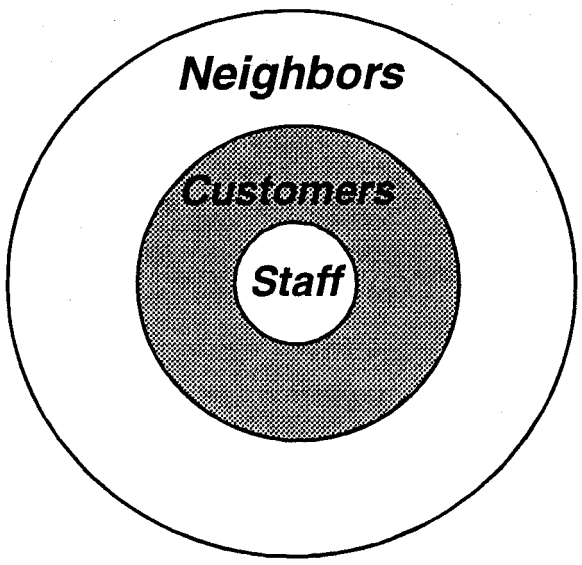
- contact a national advocacy group to elicit suggestions as to which local or national groups may be interested/suitable.

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.

Develop stakeholder participation in stages and learn as you go. You might think about the different kinds of stakeholders as forming ever broader circles around your business (see Figure 8-b). Begin with the innermost circle and work outward.

Figure 8-b. Levels of stakeholder interest



Communications

When working with either internal or external stakeholders, including your IEMS team, effective communication will facilitate a smooth implementation of your IEMS. 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 IEMS that will work. In small and large organizations alike, early communication will pay off in greater acceptance of the resulting system.

☞ Tip

It's important to revisit the communication plan at various stages of your IEMS development to add any additional communication needs for each piece of your IEMS.

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 IEMS communication policy for your company. The policy 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. In addition, the policy should discuss how the company will report environmental health and safety (EH&S) incidents, such as spills, accidents and "near misses". The policy should include who reports what, to whom, and when.

☞ Tip

Create and maintain a list of everyone you can think of who would be interested in your company's environmental activities. Include how you could reach them. You can then make a decision about where to begin. You could start with staff and later add other audiences if that suits your capabilities and needs. It is helpful to make your communication list as complete as possible to start with but pare it down to start out. Begin small, and then you can use the list to expand when ready.

Communicate regularly and integrate IEMS communication.

To build support for the IEMS, 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 intervals may be the best mechanism for ensuring good communication. Use existing channels of communication to get the message out on your IEMS 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;
- company website;
- scheduling tours of your facility;
- producing a fact sheet about your company's activities, the EMS program, and why and how your company would like to include stakeholders;
- establishing a phone line to answer questions, record concerns, etc.;
- going to local schools, community colleges, universities,

or civic organizations, such as the Rotary, that may provide a focal point of interest about your company; and

- holding public meetings when you feel it is appropriate.

Ensure that stakeholder dialogue is a two-way process. The stakeholders will want to know that their comments and concerns are being listened to and taken into account. You need to convey that your organization is genuinely and actively including them.

Worksheet 8-4 will help you develop criteria.

Worksheet 8-4:* Working with Stakeholders

Your Stakeholders	Potential Environmental Interest	What you want to tell them:	What you want them to tell you:	How to communicate with/tell them:	When	Person Responsible
(Example) Employees		Environmental policy	How to get it done	Memo, bulletin board, meetings, suggestion box, intranet		
(Example) Neighbors		Environmental policy and IEMS plans	Their environmental concerns	Meetings, open house, flyers, suggestion box, web site		
Customers		Environmental policy and IEMS plans	Their environmental concerns	Above, plus inserts in direct mail advertising, or billing, web site		
Contact Person:			Date Completed:			

*Report results on CS-01 in *Company Manual Template.*

To complete this worksheet, think about ways to use your current means of communication to begin your dialogue. Consider which methods will work to convey your message to each group, and which will work to obtain the information you want to get from each group. The means that you choose may be different for each stakeholder group.

In addition to communicating with your stakeholders, it is important to track their communication 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. Worksheet 8-5 will assist you in setting up and documenting each communication.

The following Case Study shows how "Company B" set up a process to train and then use its internal stakeholders to identify environmental concerns and some of the benefits achieved.

☞ **Tip**

Make use of current technology. A company website can be used to communicate your company's environmental policy and other important elements of your IEMS. It can also be used to solicit comments and suggestions from stakeholders.

Worksheet 8-5: Stakeholder Communication Record	
Date Communication Received:	
Type of Communication:	
Received From:	
Address/Telephone Number/E-Mail:	
Content of Communication (attach copy if possible):	
Will ABC Company Respond?	Y N
Date of Response:	
Person Responding:	
Nature of Response (attach copy if possible):	
Are Internal Actions Necessary? (If Yes, fill out a Corrective Action Form.)	Y N
Contact Person:	Date Completed:

Corresponds to CS-02 of the *Company Manual Template*.

Case Study: Company B — Working With Stakeholders

Company B is a 30-person company that manufactures sangria and chile salsa. With strong senior management backing and support from a local consultant, Company B focused initially on building environmental consciousness among its employees. To all of its workers and managers the company offered general environmental awareness training as well as more specific training on how to identify specific environmental issues. Employees then split into 10 teams, each charged with identifying the environmental issues associated with a specific area of operation, from the acquisition of raw materials through to product delivery. Based on the work of these teams, Company B developed a list of its most important environmental issues and concrete objectives and plans for improvement.

The key to Company B's success lay in using participatory teams to define new environmental problems and develop solutions. For example, the company identified waste of raw materials as an environmental issue, and teams from several areas found ways of reducing waste. Company B now requires its suppliers to use stronger containers to avoid materials spoilage. More significantly, the team from the mixing area realized that by using a spray nozzle to clean out left-over orange juice concentrate (a key ingredient in sangria) from large supply containers, it can recover an additional 3,000 pounds of concentrate (6% of its total consumption, valued at $4,200) per year. Company B gained an even greater economic benefit by revising its process for cleaning and sanitizing its stainless steel tanks, reducing use of an iodine-based cleaning fluid by 11,000 liters per year, or 90%, at an estimated yearly savings of $7,000.

Other benefits the company has realized include improved compliance, a safer work environment, and reduced emissions from its transport vehicles thanks to improved maintenance. The environmental awareness of all employees has increased significantly, with some workers extending their new-found environmental consciousness to their homes. The company has also publicized its participation in the EMS project to the local community in an effort to improve its community relations and to help improve the environmental awareness of the community.

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3.4 Training, Awareness and Competence [ISO 4.4.2]

What the ISO Standard Requires

The ISO 14001 Standard requires the facility to provide appropriate training to all employees whose work could create a significant impact on the environment. Training is therefore required for key positions across the organization—not just the environmental representative. Training is required to make key people aware of the importance of conforming with the environmental policy, procedures, and with the EMS. They must also understand how their work could create significant impacts either actually or potentially, and their specific responsibilities as defined in environmental procedures and work instructions, including what could happen if they don't follow the procedures. A demonstration of competency is required, as evidenced by education, training, or experience.

Starting Points

Most facilities that have an environmental manager rely solely on the prior educational experience of that person. Other than legally mandated training for certain individuals, no training/skills assessment has been made across the facility. Therefore, companies are particularly vulnerable to problems that occur when a key person leaves. Typically, in small shops, no one may be ready to step in to carry the responsibility.

Implementation Tips

1) Most metal finishers started by listing the functional areas within their facilities that could create significant environmental impacts. A "training needs matrix" was used to identify the specific job classifications or specific individuals who required training. Include your existing environmental training needs, such as Hazardous Waste Operators and Waste Treatment Operators Training,

2) The minimum amount of training required is usually referred to as "awareness training," and includes a brief discussion of the EMS, and the specific tasks, procedures, and work instructions that are related to significant (actual or potential) environmental impacts.

3) Cross check the training needs you have identified with your environmental operation and control procedures. Be sure that you don't overlook periodic functions, such as start-up and shut-down, maintenance, laboratory, and contract workers.

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4) Remember that significant impacts covers your products and services as well as your operations and activities. You may need to provide some level of training for engineering and design staff as well. Rack design and maintenance areas are examples of these types of functions.

5) EMS training does not need to be stand-alone training. Look for opportunities to combine training with existing environmental, health, and safety programs. Formal training may be the most direct way to ensure employee awareness but it is not the only option. For example, employees can read training information and sign off that they read and understood the contents. Whatever option you choose, it's a good idea to have verifying signatures of all those who received training.

Examples

1) Procedures for Identification of Training Needs

The best procedures included a fairly detailed description of the process to be used for identification and review of environmental training needs. The procedures covered, for example:

- ❑ Basis for review
- ❑ Frequency of review (e.g. a minimum of once per year)
- ❑ What to consider (future requirements, technological advancements, environmental requirements, changes in company directives, cross-functional and specialized needs, new or revised policy and procedures)
- ❑ Development of a training program
- ❑ Mechanisms and responsibility for performing training
- ❑ Evaluation of training and record keeping (e.g. EH&S Director maintains a training file for each production employee)

2) General Awareness Training

The Standard requires employees at each relevant function and level to be made aware of certain aspects of the EMS. Some aspects (for example, the importance of conformance with the environmental policy and procedures) will be broadly applicable to most, if not all, of the employees at a facility. One company included a section on Awareness Training in their EMS Training procedure:

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The Environmental Committee is responsible for making individuals and departments aware of:

- ❑ The importance of conformance with the environmental policy and procedures, and with the requirements of the EMS
- ❑ The significant environmental impacts (actual or potential) of their work activities and the benefits of improved performance
- ❑ Roles and responsibilities for achieving conformance with the requirements of the EMS, including emergency preparedness and response
- ❑ The potential consequences of departing from specified operational procedures

Conformance Check

The ISO 14001 Standard requires that "all personnel whose work may create a significant impact upon the environment" receive appropriate training. One metal finisher noted in their training, awareness, and competence procedures, that training needs would be identified by a review of:

- personnel
- process equipment
- the uniqueness of the process to be performed

The criteria for determining training needs did not include employees whose work may be linked to a significant environmental impact. While this omission is not in itself a nonconformance with the ISO 14001 Standard, it may lead to an important omission in determining training needs.

Note that you must actually train your employees. Simply referring to posted information or minutes from meetings would not provide effective training. An EMS auditor (internal or external) would verify implementation of a training program through interviews with employees throughout the facility. Employees may be asked questions such as:

- In your own words, what is your company's environmental policy? What does the policy mean to you and your job?
- How does your job interact with the environment? What procedures describe what you do? What might happen to the environment if you did not follow procedures?

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- What would you do if there were a spill in your area?
- What types of environmental training have you received?

In addition, an EMS auditor may request verification that training was provided (such as sign-in sheets) and ask how you determined the competence of individuals whose jobs may cause significant environmental impacts. (Note: The standard gives your company wide latitude in determining the basis for the competency of personnel).

EMS Links

- Policy: The connection between policy and training is direct. The ISO 14001 Standard requires communication of the environmental policy to all employees, but just sending them a copy of the policy is not enough. The standard also requires that employees are aware of the importance of conforming to the policy. This awareness is a key part of many company's general environmental awareness training.
- Environmental aspect: Aspects are linked to training through the references under the training, awareness, and competence section to environmental impacts (e.g., "It shall require that all personnel whose work may create a significant impact...," "The significant environmental impacts of their work..," "tasks which can cause significant environmental impact.."). It is important to remember to review your training program when new significant aspects (and therefore, significant impacts) are identified to be sure all appropriate personnel are receiving the necessary training.
- Structure and responsibility: Employees should be aware of their roles and responsibilities in conforming with the environmental policy, company procedures, and any other requirements the company has made part of their EMS.
- Operational control and Monitoring and measurement: Employees must be aware of the procedures that govern their work including any monitoring or measurement that is part of their job.
- Emergency preparedness and response: The standard specifically calls for employees to be trained on or aware of the facility's emergency preparedness and response requirements.

ELEMENT 3.3

TRAINING

Training is an important aspect of any EMS because it can be used to build awareness and competency on (1) the EMS and (2) specific tasks related to meeting EMS objectives and targets. Training at C/Us is often further complicated by the complex and diffuse nature of their organizational structure, and the number of different departments in which EMS Participants work.

The goal of a C/U's EMS training should be three-fold:

1. EMS Awareness – provide understanding of what the C/U's EMS is and how it works
2. Task-Specific Training – to provide task-specific training on topics to those EMS Participants able to aid progress toward the EMS objectives and targets
3. Training Required by Regulations – to comply with applicable environmental and health and safety training requirements

Training Hints:

- Incorporate EMS Awareness Training into existing training received by EMS Participants and consider making the training a regularly scheduled update.
- Consider on-line training as a way to accommodate varying schedules and far-flung audiences
- Consider videotaping training sessions for use later as refreshers or with new employees.
- Factor training needs and abilities into hiring practices.

Potential Training Resources:

- EMS Team Members
- Outside Consultants
- Departmental Professors
- Graduate Students
- Suppliers/Vendors
- Local, State and Federal Regulatory Agencies
- Self-Directed Study
- Computer-Based Training

In tackling EMS Awareness training, develop an agenda and materials for EMS information you want every EMS Participant to understand and then add training modules to accommodate the specific needs of particular audiences. For example, the EMS Team likely wants each EMS Participant to understand the C/U's:

- Environmental policy;
- Significant environmental aspects and impacts;
- EMS roles and responsibilities; and
- Initiatives for meeting EMS objectives and targets.

In addition, the EMS Team may want to develop specific EMS awareness training modules such as:

- "EMS Costs and Benefits" for C/U administration
- "EMS Administration Review" for the EMS Administration Review Team

- Environmental Policy for new student orientation

Implementation: Use the following steps, *Procedure 3.3, Training*, and the two tools provided in this element (EMS Training Matrix and Individual EMS Training Plan) to build a list of training needs for each EMS Participant.

1. Identify Training Needs – Catalogue training needs for each employee in each of the three categories listed above and fill in the EMS Training Matrix starting with EMS Awareness Training topics listed above, adding task-specific training relating to specific objectives and targets, and finally adding Training Required by Regulations (often apparent after performing a compliance review as part of *Element 2.2, Compliance*). This training matrix will help you determine "big picture" training needs and develop individual training plans according to one's position. This tool might also be useful for managers when estimating training expenses and planning for new employee training and orientation. An example of a completed EMS Training Matrix is provided.

2. Build Individual EMS Training Plans – Complete training plans for individuals or categories of people (i.e., landscaping staff or laboratory managers) using the tool provided. An example of an Individual EMS Training Plan is provided.

3. Conduct Needed Training – Building upon existing C/U training programs, identify training resources and conduct training.

4. Maintain Training Records – Use the Individual EMS Training Plan to record the dates training is planned and the dates training has occurred.

5. Evaluate Training Effectiveness – Review the impact of training on EMS effectiveness through interviews of EMS Participants and considering the results of EMS Audits and Management Reviews.

SAMPLE PROCEDURE ONLY – REVISE AS NEEDED

[C/U Name]	EMS Procedure	3.3
	Effective Date	
	Subject	Training

Purpose This procedure is used to develop and implement a training program for EMS Participants that (1) achieves EMS awareness, (2) provides task-specific training related to EMS objectives and targets, and (3) provides training required by regulations.

Step 1 The EMS Manager will identify training needs for each employee by completing the EMS Training Matrix and identifying training needs in any of three categories: EMS Awareness Training, Task-Specific Training relating to specific objectives and targets, and Training Required by Regulations.

Step 2 The EMS Manager and others will review past training and the nature of the employee's work and develop individual training plans for EMS Participants. Individual training plans will be developed, reviewed, and revised when the following events occur: a new hire is made, an EMS Participant's role or responsibility changes, a new material, process, equipment, or regulation is introduced to a department or functional area.

Step 3 The EMS Manager will arrange for and/or conduct needed training according to the schedule identified in the individual training plans.

Step 4 The EMS Manager will document dates, attendees and subject for past and planned training in the individual training plans. Training documentation will be retained at the facility for at least 2 years.

Step 5 Training effectiveness will be evaluated annually as part of the management review to ensure that EMS training is contributing to the EMS being implemented effectively; appropriate changes to the training program will be made based on the findings.

Responsible Person: _____

Signature and Date: _____

Employee Name/s: _____

Job Function(s): _____

Date: _____

*All training planned and completed by the EMS Participant should be recorded below; attach training agendas, materials, and sign-in sheets as appropriate.

Training Subject	Date Planned	Date Completed

_____

Responsible Person

[redacted]

Employee Name/s: Sara Usepa

Job Function(s): Grounds / Landscape Maintenance

Date: FY 2001-02

***All training planned and completed by the EMS Participant should be recorded below; attach training agendas, materials, and sign-in sheets as appropriate.**

Training Subject	Date Planned	Date Completed
40-Hour OSHA Training	*February 2001*	*February 2001*
Equipment Safety & O&M Refresher Course	*April 2001*	*May 2001*
Pesticide Management	*July 2001*	*July 2001*
EMS Awareness Training	*September 2001*	

Responsible Person

Effective Date

TRAINING MATRIX

nd Building Maintenance			Academic Departments				Campus Environmental Groups	
Field Supervisors	Field Staff	Student Staff	Department Head	Laboratory Supervisor	Laboratory Staff	Student Staff	Director/President	Members/Student

	Environmental Health and Safety			Facilit	
Responsibility	EH&S Director	EH&S Staff	Student Staff	Executive Manager/Director	Zone/Department Managers
EMS Awareness Training - University EMS Status Updated - Semi-Annual Policy Review & Development		X	X		
Supervisor EMS Training - EMS Awareness Training Development - Objective and Target Communication Training - Policy Implementation Training	X			X	
EMS Audit Training					3-4 Auditors should be Note: If possible, er
Hazardous Waste Management - 40 – Hour OSHA Training & Certification - University-Specific Policy Review		X	X		
Compliance Audit Training	X	X			
P2 Audit Training - Job-Specific P2 Audit Training - P2 Communication and Implementation Training	X	X			
Laboratory Procedure Training - Laboratory Policy Review - Laboratory P2 Training	X	X			

_____

Responsible Person

_____

Effective Date

CPW ENVIRONMENTAL MANAGEMENT SYSTEM PROCEDURE

The on-line version and secured hardcopy are the controlled documents. The secured hardcopy will be identified by an "Official Document" stamp giving date of distribution. Any and all other documents are uncontrolled. Contact the EMS Program Manager for revision level status.

Effective Date:	**October 1, 2000**	**Page 1 of 3**
Revision: 2	**Identification Number: EMS – 4. 4. 2**	
Title:	**Training, Awareness and Competence Procedure**	
Prepared By:	**EMS Procedures Subcommittee**	
Reviewed By:	**EMS Management Steering Committee**	
Approved By:	**William E. Koopman Jr., General Manager**	
	John Cook PE, Assistant General Manager	
Date Approved;	**August 25, 2000**	

0.0 Requirement: ISO 14001, Sub Clause 4.4.2 Training

1.0 Purpose

To identify, provide and track training that will help associates to minimize environmental impacts and increases operating efficiencies.

Scope

ISO 14001, sub clause 4.4.2, requires CPW to identify training needs and provide specific training to those associates whose work activities could cause adverse environmental impact.

3.0 Responsibility & Authority

3.1 Each department head shall identify environmental training needs.

3.2 The department head is responsible for maintaining environmental training requirements.

3.3 Environmental training needs will be evaluated annually by the department.

4.0 Procedure

4.1 Identification of Training Needs

The knowledge and skills of associates necessary for the department to achieve environmental objectives will need to be identified. Knowledge and skill levels should be considered in recruitment and personnel selection. Ongoing development of associate skills will occur through internal and external training and education programs.

4.2 Conduct of Environmental Training

Training appropriate to the achievement of environmental policies, objectives and targets will be provided to all personnel within the department. Associates should have an appropriate knowledge base, which includes training in the methods and skills required to perform their tasks in an efficient and competent fashion and knowledge of the impact their activities can have on the environment if performed incorrectly.

4.3 Legal and Other Requirements

Education and training will be performed in each department to ensure that associates have appropriate and current knowledge of regulatory requirements, environmental policy and the department's procedures and objectives. The level and detail of training will be determined according to the work assignment or task.

4.4 Training Elements

Departmental environmental training programs should have the following elements:

- Identification of associate training needs to accomplish job assignment;
- Development of a training plan to address defined needs;
- Training of target associate groups;
- Documentation of training received;
- Evaluation of training received.

NOTE: Examples of types of Environmental Training:

Environmental Policy All associates would be required to receive this training to gain an understanding and commitment to the environmental policy, objectives, and targets of CPW.

Strategic Environmental Management Senior management may receive this training to gain commitment and alignment of CPW's environmental policy.

Skills Enhancement Associates with environmental responsibilities linked to significant aspects shall be required to receive identified training to improve performance in specific areas of the department (e.g. operations, laboratory, engineering, maintenance, etc).

Regulatory Compliance Associates whose actions can affect environmental compliance shall be required to receive training on the appropriate regulatory and internal work instruction requirements and be made aware on the consequences of regulatory non-compliance or deviation from approved work instructions.

4.5 Adequate Resources

Adequate resources are to be made available to provide the identified training. In certain cases, training may require certified trainers, such as CDL, HAZWOPER or CPR. Environmental training will also be provided within six months of an associate's hire date. Annual refresher training will be conducted on CPW policy, and departmental objectives and targets.

4.6 Tracking the Training Hours

To document compliance with regulatory and policy requirements, training hours will be collected and tracked. The department head will compare training received with the training plan to ensure policy goals are met. Training records should include:

- Associate name,
- Job title,
- Job description,
- Training requirements,
- Total training hours by category

5.0 Related Documents and Data

5.1 Environmental Training Records
5.2 Instructor Certification Records
5.3 CPW Training Record Form

Naval Aviation Depot, CH

ISO 14001 Procedure

Title	Document Effectivity	Status
Training, Awareness and Competence	First Issue Date 01/22/1999 Revision Date 04/27/1999	Issued
EMS Procedure No	**EMSMR**	Rev
EMSP442	Melito M Barrera/NI/NADEP	2

Purpose

To identify training needs for NADEP personnel whose work may create a significant impact upon the environment.

Scope

This procedure covers the roles internal to the NADEP organization associated with training, awareness and competence of the EMS.

Responsible Party	Responsibilities
EMS MR	• Coordinates EMS training requirements.
OUMR	• Assists in the coordination and delivery of Environmental Policy and SEA training, as necessary.
IPO	• Ensures that contractors and service providers whose assigned actions could contribute to environmental impacts targeted by the EMS objectives and targets receive training to the EMS.
EPO	• Assists, as necessary, in training contractors and service providers whose assigned actions could contribute to environmental impacts targeted by EMS objectives and targets.

PROCEDURE

1. **The EMS MR will:**

a. Coordinate Environmental Policy training for NADEP employees with the OUMRs.

b. Coordinate SEA training for applicable NADEP employees with the OUMRs and in other parts of the NADEP organization.

c. Successfully complete a 24-hour course on EMS Audits taught by an individual who successfully completed an ISO 14001 Lead Auditor course. A copy of the course certificate will be kept on file (see EMSP 453).

d. Coordinate new contractor and service provider training to the EMS with the EPO and the IPO. Training provided to contractors will be documented in the DCRS.

e Coordinate training for EMS internal auditors.

f. Coordinate management training for key management and others identified by key management.

g. Ensure that key management and others identified by the EMS MR, receive training in the use of the virtual EMS.

h. Designate individuals to conduct the various awareness trainings.

i. Ensure that identified training is documented (see EMSP 453).

2. The OUMRs will:

a. Ensure that personnel receive Environmental Policy training in coordination with the EMS MR.

b. Ensure that personnel whose actions can impact objectives and targets, receive training to the SEAs in coordination with the EMS MR.

3. Key Management (ESC, CO and OUM) will:

a. Receive a one-time, one hour management training specific to the EMS.

4. IPO will:

a. Implement procedures to ensure that new contractors and service providers are provided relevant environmental training in conjunction with the EPO.

5. The EPO will:

a. Identify required training needed to maintain compliance with relevant environmental legislative, regulatory, permit and other legal requirements (see EMSP 432).

b. Document all relevant compliance training delivered to NADEP personnel.

6. EMS Auditors will:

a. Receive a one-time, 24-hour training covering the ISO 14001 standard, details of the EMS, and auditing techniques. The training will be conducted by either a certified auditor trainer (certified by one of the ISO 14001 Accreditation Bodies), or an individual who successfully completed a 40-hour course conducted by an ISO 14001 certified auditor trainer. A copy of the course certificate will be kept on file (see EMSP 453).

References

ISO 14001:1996, Section 4.4.2

EMSP 432 Legal and Other Requirements

EMSP 453 Records Management

Document Edited By:
Form Rev 1.0.2 15 APR 2000

Environmental Management System
UNIVERSITY OF MISSOURI-ROLLA

Training Programs (And Proposed Training Programs) To Be Offered by Environmental Health & Safety

Environmental Management System (EMS) General Awareness Training

Recipients
All UMR Employees

Course Schedule

- Existing employees have received web-based training.
- New employees (faculty & staff) receive general awareness information during new employee orientation.
- Graduate assistants receive general awareness training each semester as part of the Campus Environmental Issues Training.

Course Content

I. Environmental Policy
II. Significant Environmental Aspects of UMR Activities
III. Importance in Following Environmental Procedures
IV. Consequences of Not Following Environmental Procedures
V. Emergency Preparedness
VI. Environmental Objectives & Targets

Campus Environmental Issues Training

Recipients

- Laboratory Managers: (New faculty and Graduate Assistants)
- Maintenance/Construction Technicians
- Maintenance/Construction Supervisors

Course Schedule
Offered once per semester

Course Content

I. EMS General Awareness Training

II. UMR Hazardous Materials Management Procedures
III. UMR Hazardous Waste Management Procedures
IV. Laboratory Safety Issues

General Environmental Health & Safety Training

Proposed new training program

Recipients

- Clerical Personnel- (Shipping/receiving or otherwise handling hazardous materials)
- Maintenance/Construction Technicians
- Custodial Workers

Bio-Hazardous Materials Training

Proposed new training program

Recipients

- Clerical Personnel (Shipping/Receiving or otherwise handling bio-hazardous materials)
- Laboratory Managers: (New faculty and Graduate Assistants)
- Student Health Services Personnel
- Intercollegiate Athletics & Intramural Personnel
- Custodial Workers
- Custodial Supervisors

Course Schedule
Undetermined

Course Content

I. Proper storage and handling of bio-hazardous materials
II. Proper disposal methods for bio-hazardous waste

Initial Radiation Safety Training

Recipients

- Staff Radiation Workers
- Faculty Radiation Workers
- Student Workers

Course Schedule
Course offered all year long on an as needed basis.

Course Content

I. General Awareness Information
II. Radioactive Materials/Handling Requirements
III. Emergency Procedures
IV. Prenatal Exposure R.G. 8.13
V. Radiation Signs, Symbols, etc.
VI. NRC Form 3-Notice to Employees
VII. Instructions for Users of Radioactive Materials
VIII. Hand-Held Instrument Requirements

Annual Radiation Safety Refresher Training

Recipients

- Staff Radiation Workers
- Faculty Radiation Workers
- Student Radiation Workers
- UMR Custodial Staff & Support Personnel

Course Schedule
Course offered once a year, or as requested

Course Content

I. Radioactive Materials/Handling Requirements
II. Emergency Procedures
III. Prenatal Exposure R.G. 8.13
IV. Radiation Signs, Symbols, etc.
V. NRC Form 3-Notice to Employees
VI. Individual Authorizations and Materials Authorized
VII. Hand-Held Instrument Training and Proficiency

Health Physics Training for Reactor Workers

Recipients

- UMR Reactor workers
- Custodial Staff assigned to the building

Course Schedule
Course offered once a year

Course Content

I. Radioactive Materials/Handling Requirements
II. Emergency Procedures
III. Prenatal Exposure R.G. 8.13
IV. Radiation Signs, Symbols, etc.
V. NRC Form 3-Notice to Employees
VI. UMR Nuclear Reactor Emergency Procedure

Asbestos Awareness Training

Recipients

- Maintenance/Construction Technicians
- Maintenance/Construction Supervisors
- Custodial Workers
- Custodial Supervisors

Course Schedule

- Existing UMR employees were trained in January 2001
- New employees are given the training during orientation, on an as-needed basis

Course Content

I. "Are You At Risk" video
II. "Controlling Exposures" video
III. Campus Contact Information
IV. References
V. UMR Asbestos Procedures

RECORDKEEPING

Records of training conducted by EHS are maintained in EHS office files.

Last Modified: *Tuesday, 19-Jun-2001 12:19:40 CDT*

The EMS Manager[2] shall chair the EMS Program Team, ensure the day-to-day maintenance of the EMS, and be accountable to the Director for the performance of the EMS.

The Director and the EMT shall be responsible for providing the resources essential to the implementation and control of the EMS.

A Management Review Team, comprised of the Director and members of the EMT, shall annually in November review the EMS for suitability, adequacy, and effectiveness.

5. Training, Awareness, and Competence

5.1. General Awareness Training

All DEQ employees shall receive general awareness EMS training. In the initiation of the EMS during 2001, Director of the Office of Pollution Prevention shall prepare a core general awareness training package and deliver this training, with the assistance of other EMS Program Team members, to all of DEQ's approximately 900 employees. The general awareness training subjects shall include the Environmental Policy, the potentially significant environmental impacts, the objectives and targets, and employees' roles and responsibilities in conforming with the requirements of the EMS.

Thereafter, the DEQ Training Manager shall ensure that EMS general awareness training shall be embedded in the overall DEQ training curriculum being developed by the DEQ Training Committee.

5.2. Significant Impact Training

Concurrent with its determination in February of each year as to which of DEQ's environmental aspects are potentially significant environmental impacts, the EMS Program Team shall identify the training needs of personnel whose work can cause a significant impact on the environment, determine the criteria for personnel competence, and recommend timeframes for delivery of training to the DEQ's Training Committee. These training needs shall become a part of the Environmental Objectives and Targets for the upcoming fiscal year.

The Training Committee shall determine the means and methods for delivery of this significant environmental impact training subject to DEQ's overall mission requirements.

5.3. Training Records

Records of training related to the EMS shall be established and maintained by the DEQ's Training Manager in accordance with Virginia's record retention policy for state agencies.

[2] The EMS Manager responsibility shall be carried out by the Director of Pollution Prevention & Compliance Assistance (Lead), Director of Enforcement Coordination, Director of Administration, and Director of General Services.

EMS Training Log (Sample)

Training Topic	Attendees*	Frequency	Course Length	Course Method	Comments	Date Completed
EMS Awareness						
Supervisor EHS Training						
Hazardous Waste Management						
Hazardous Waste Operations						
Spill Prevention & Response						
Chemical Management						
Emergency Response						
Accident Investigation						
Hazardous Materials Transport						
Hazard Communication						
Personal Protective Equipment						
Fire Safety						
Electrical Safety						
Hearing Conservation						
Confined Space Entry						
Lock-out/Tag-out						
Bloodborne Pathogens						
Job-Specific Training (list)						

Attendees Code
1: All Employees
2: Supervisors / Managers
3: Operators
4: Maintenance
5: Material Handlers
6: Engineering

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e-mail:
ems@kppc.org

Session 1

- Agenda
- KPPC "EMS / ISO 14001 Overview"
- Reading for Session 1:

  - EPA's "Aiming for Excellence" Report to promote the use of Environmental Management Systems
  - EPA's Draft EMS Action Plan
  - EPA Position Statement on EMSs (Federal Register, March 12, 1998)
  - Ford Requires Supplier ISO 14001 Certification
  - GM Requires Supplier ISO 14001 Certification
  - How and When to Develop ISO 14001 Series Environmental Management Systems
  - ISO 14001: A Discussion of Implications for Pollution Prevention
  - Kansas Air Lines: Do You Need an EMS? (.pdf format)
  - The Environmental Manager: Jury Out on EMSs as Reg Substitute

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Session 2

Agenda

Presentations: *

- KPPC "Planning for Success"
- **Mentor Presentations**
  - Bridgestone/Firestone Lavergne
  - Ford Motor Company
  - Hitachi Automotive Products
  - Toyota Motor Manufacturing of Kentucky, Inc
  - Toyota Motor Manufacturing of North America
  - Visteon Steering Systems

(* requires Microsoft PowerPoint)

Sample Environmental Policies

- Bundy Corporation
- Metokote Corporation
- P.H. Glatfelter
- Tier 2 Automotive Supplier
- Toyota Motor Manufacturing Kentucky, Inc.

Company A Sample Environmental Manual (Section 4.3.1-4.3.4)

Mentor Company Environmental Procedures:**

- Company B Environmental Aspects ID
- Company C Chemical Control Procedure
- Company C Environmental OSHA Control Procedure
- Company E Dealing with Environmental Impacts Procedure
- Company D Environmental Aspects Information
- Company E Handling of Regulatory Requirements Procedure
- Company D Environmental Management Program
- Company D Environmental Policy
- Company D Regulatory Tracking Procedure
- Company E Identification of Environmental Objectives and Targets
- ***Bridgestone/Firestone Lavergne***
  - Determination of Significant Environmental Aspects Procedure
  - Environmental Aspects List
  - Summary of Legal and Other Requirements
  - Identification of Legal and Other Requirements Procedure
  - Objectives and Targets for Significant Environmental Aspects
- ***Visteon Steering Systems***
  - Environmental Aspects Identification EP027Attachment
  - Identification of Aspects, Significance, Objectives & Targets Procedure EP027

- Relevant Legislative Permits and Other Requirements
- Objectives & Targets
- Objectives and Target Program Summary Regulated Waste EMP033
- Objectives and Targets Program Summary Mineral Spirits EMP026
- Objectives and Targets Program Summary Steam Boilers EMP035
- Master list of EMPs
- EMP Progress Summary Air Emissions Piston GrindersEMP014
- EMP Progress Summary CFC Program EMP036
- EMP Progress Summary EMP005
- EMP Progress Summary FESOP Permit EMP037
- EMP Progress summary Railroad Tracks EMP013
- EMP Progress Summary Training EMP034
- EMS Progress Summary Storm Ponds EMP010
- List of Environmental References

- *Toyota Motor Manufacturing Kentucky, INC.*
  - Identifying Environmental Aspects Procedure
  - Determining Significance of Environmental Aspects Procedure
  - Identification and Maintenance of Legal and Other Requirements Procedure
  - Establishing Objectives and Targets Procedure
  - Updating Objectives and Targets Procedure
  - Establishment of EMPs Procedure Example

(** requires Adobe Acrobat Reader)

Get Acrobat Reader

Reading for Session 2:

- Improving Environmental Performance with a Systems Approach
- The Attorney's Role in ISO 14001 Implementation
- PWB Case Study #7: Identifying Objectives for Environmental Management Systems
- PWB Case Study #8: Building an Environmental Management System
- Practical Pollution Prevention Reprints - Systems Approach Tools

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Session 2 Agenda

8:00-8:30	Welcome and introduction/manual overview (Mr. Cam Metcalf)
8:30-9:15	ISO 14001 on environmental policy, aspects, legal and other requirements, and objectives and targets (Tim Piero)
9:15-10:00	Industry presentation (Carol Maedel, Casco Products)
10:00-10:15	Break
10:15-11:00	Industry presentation (Sean McCarthy, Bridgestone/Firestone)
11:00-11:45	Techniques for determining aspects, impacts, and significance/exercise (Cam Metcalf, Kentucky Pollution Prevention Center)
11:45-1:00	Lunch (on own)
1:00-1:15	EMS Alliance webpage and email listserve overview
1:15-2:00	Industry presentation (Ben Kuo, Toyota Motor Manufacturing Kentucky, Inc.)
2:00-2:45	Legal and other requirements/exercise (Cam Metcalf, Kentucky Pollution Prevention Center)
2:45-3:15	Questions and answer/Wrap-up and adjourn

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Session 3

▶ Agenda

▶ Presentations: *

- KPPC "EMS Implementation and Operation"
- Mentor Presentations
  - Bridgestone/Firestone Lavergre
  - Ford Motor Company
  - Toyota Motor Manufacturing of Kentucky, Inc.

(*requires Microsoft PowerPoint)

▶ Company A Sample Environmental Manual (Sections 4.4.1 - 4.4.7) **and** Sample Environmental Procedures

▶ Mentor Company Environmental Procedures:**

- Company B Control of Documents
- Company C Structure and Responsibility Procedure
- Company C Communication Procedure
- Company C Document Control Procedure
- Company C Emergency Preparedness and Response Procedure
- Company E Structure and Responsibility
- Company E Training Awareness and Competence Procedure
- Company E Communication Procedure
- Company E Document Control Procedure
- Company E Emergency Preparedness and Response Procedure
- Company E EMS Documentation Procedure
- *Bridgestone/Firestone Lavergne*
  - Control Procedure
  - Plant Inspection Form
  - Pond Inspection Form
  - Sample EMP spreadsheet
  - Sample EMP Water Program ENV-016
- *Visteon Steering Systems*
  - Roles and Responsibilities
  - Structure and Responsibility Matrix
  - Training Needs
  - Training, Awareness and Competence
  - Responding to Community Complaints & Inquiries
  - Internal Environmental Communication
  - Community Complaint-Inquiry Report Form
  - Document Control Procedure
  - Spill Response Management Procedure

- *Toyota Motor Manufacturing Kentucky, Inc.*
  - Organizational Structure Example
  - Structure and Responsibility Procedure Example
  - Training Identification Matrix
  - Training, Awareness, and Competency Procedure Example
  - Identification of Training Needs Procedure Example
  - External Communication Procedure Example
  - Environmental Communication Form Example
  - Internal Communication Procedure Example
  - Document Control Procedure Example
  - Emergency Preparedness and Response Procedure Example

Reading Material for Session 3:

- Compliance-Focused Environmental Management System-Enforcement Agreement Guidance (EPA 330/9-97-002) This document presents key element for a compliance-focused EMS model and how they may be incorporated into a settlement agreement. This document is in Adobe Acrobat PDF format.
- EMR Survey Reveals Regulatory Violations in the Course of Several ISO 14001 Audits
- Ford Reaches ISO 14001 Milestone: All Plants Certified
- ISO 9001 and 14001: Specialty Manufacturer Develops Both Management Systems Concurrently
- The Saturn + 5 ISO 14000 Project
- Using Design for the Environment Concepts in Your EMS

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Session 4

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Presentations *

- KPPC "EMS Checking and Corrective Action"
- **Mentor Presentations**
  Toyota Motor Manufacturing Kentucky, Inc.
  Bridgestone/Firestone Lavergne

(*requires Microsoft PowerPoint)

Class Exercises: Monitoring and Measurement Procedure

- Example One
- Example Two
- Example Three
- Example Four
- Example Five
- Example Six

Company A Environmental Manual (Section 4.5.1 - 4.6)

Mentor Company Environmental Procedures:**

- Company B Sample Contractor EMS Form
- Company B Sample Contractor Information Sheet
- Company C Monitoring and Measurement Procedure
- Company C Operational Control Procedure
- Company C Corrective Action Procedure
- Company E EMS Audit Procedure
- Company E Operational Control Procedure
- Company E Monitoring and Measurements Procedure
- Company E Records Procedure
- Company E Management Review Procedure
- *Visteon Steering Systems*
  - Monitoring and Measurement Procedure EP008
  - EMS Measurables EP008
  - Calibration Requirements EP008
  - Computer Systems Disaster Recovery ProcedureEP019
  - Corrective and Preventive Action Procedure EP026
  - Corrective and Preventive Action Request Form
  - Environmental Audit Summary Form
  - Internal Audit Form EP007Forms
  - Internal Audits and Non Conformance Follow-upEP007
  - Management Review of EMS Procedure EP028
  - Master List of Records
- *Toyota Motor Manufacturing Kentucky, Inc.*

- Operational Control Procedure example ea_000131_00
- Monitoring and Measurement Procedure example ea_000134_00
- Nonconformance, Checking and Corrective Action Procedure example ea_000126_00
- Records Procedure example ea_000137_00

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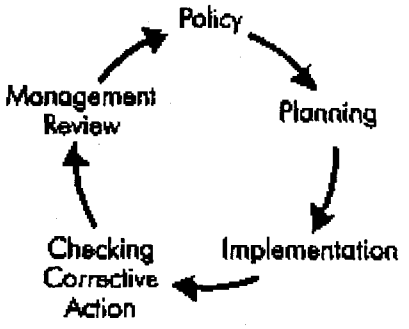
- Agenda
- Presentations *
  - Introduction to Auditing
  - Auditing Documentation
- Mentor Company Presentations *
  - Color & Composite Internal Auditing
  - Visteon Steering Systems Internal Auditing

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- EMS/ISO 14001 Auditing Tool Workbook

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Environmental Management Systems

EMS Development Course for Government Agencies - Introduction and Course Schedule



Welcome! My name is Julie Woosley and as coordinator of the EMS Development Course for Government Agencies, I hope this Web site will be a valuable resource to you as you work to implement an EMS at your facility over the coming year.

Below you will find a table charting the course by meeting date. Each date will link you to a page with that day's schedule and relevant documents, including speaker presentations, links to information about the day's topics, links to examples from real EMSs, directions to the course meeting place, and course handouts. You will want to print out these handouts before the course meeting date and bring them with you.

A **complete schedule** is available, and will be updated continually as the course continues, as will all the information on this Web page. It is intended to serve as your virtual textbook and main course information resource. You will want to check back regularly for changes in the schedule and documents. Feel free to print what you would like to keep, or save natural resources by using the documents online. Opinions about this Web site are appreciated; see page bottom for contact. A list of course participants and their contact information is also available.

Course Date	Course Subject	Course Location
July 23, 2001	**EMS and ISO 14001 Overview Training Class (optional)**	Parker Lincoln Building in Raleigh, 1:30 - 4:30 p.m.
July 24, 2001	**EMS Overview**	Parker Lincoln Building in Raleigh
Aug. 28, 2001	**Aspects and Impacts**	Parker Lincoln Building in Raleigh
	Aspects and Impacts -	Novozymes facility

Oct. 9, 2001	**Ranking**	in Franklinton
Nov. 13, 2001	**Objectives and Targets, the EMS Program and Implementation and Operation**	NC Zoological Park in Asheboro
Jan. 8, 2002	**Training, Awareness and Competence**	Charlotte
Feb. 12, 2002	**Operational Control and Monitoring and Measurement**	Cary
March 19, 2002	**Communication, Document Control, Records and Emergency Preparedness and Response**	Winston-Salem
April 16, 2002	**Internal Auditing and Checking and Corrective Action**	Shelby
April 17, 2002	**ISO 14001 Internal Auditor Training**	Shelby
May 14, 2002	**Management Review and Third Party Certification**	Toy Lounge, Dey Hall, UNC-Chapel Hill
June 25, 2002	**Graduation Ceremony**	EPA's new campus, RTP, 10:30 a.m. - 2:00 p.m.

All classes will meet from 9:30 a.m. to 4:00 p.m. unless otherwise noted.

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(919) 715-6500/(800) 763-0136 - fax (919) 715-6794
Pollution prevention or EMS question or comment? Send e-mail to: Julie Woosley
Site question or comment? Send e-mail to: Webmaster@p2pays.org

32648 e PDF

Structure & Responsibility

4.4.1

Section I

"Structure & Responsibility" from NSF Guide

"Structure & Responsibility" from NSF Metal Finishers Guide

"Roles & Responsibilities" from Colleges and Universities EMS Guide

Section II

Charleston Public Works EMS Structure and Responsibility Procedure

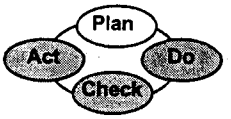
Alumax Implementation and Operation Procedure

Naval Aviation Depot North Island Structure and Responsibility Procedure

Virginia Department of Environmental Quality Structure and Responsibility Statement

Sample Responsibility Matrix

Comments:



Structure and Responsibility

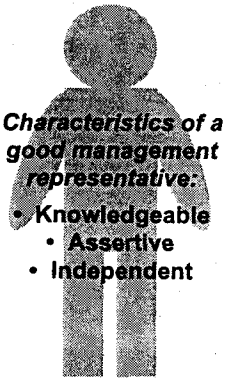
Aligning your resources to succeed

"Resources include human resources and specialized skills, technology, and financial resources."

- ISO 14001

For an EMS to be effective, roles and responsibilities must be clearly defined and communicated. The commitment of all employees is needed for an EMS to live up to its full potential.

Top management plays a key role by **providing resources** needed to implement the EMS. This is one of the most important jobs of top management (see "Finding Resources" on next page). In some organizations, "top management" might be a single individual, while in others it might be a group of people (such as a board of directors).



An effective management system needs an advocate. Thus, top management should **appoint a management representative.** This representative (1) ensures that the EMS is established and implemented; (2) reports on its performance over time; and (3) works with others to modify the EMS as needed. The management representative can be the same person who serves as the project champion (as discussed in Section 3), but this is not mandatory. A business owner, plant or shop manager, or any number of other people might serve as an effective EMS management representative.

More organizational advantages of small business:

- ☑ shorter lines of communication
- ☑ less complex organization
- ☑ limited delegation
- ☑ simpler access to management

Small and medium-sized organizations may have **advantages** over larger ones in structuring their resources for environmental management. Because personnel and other resources are generally more limited in smaller organizations, people often "wear more than one hat" and have experience in performing multiple functions. An individual responsible for environmental management in a smaller organization also might be responsible for quality, health & safety, facilities, or other functions. In such cases, integrating environmental responsibilities with other functions can be greatly simplified.

Getting Started

Look at:

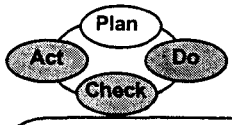
- ☑ Program Scope
- ☑ Environmental Aspects
- ☑ Objectives
- ☑ Previous audits
- ☑ Other systems

Getting Started:

The following questions can help you determine the right organizational structure for environmental management:

- ***What is the scope of our environmental management program?*** What capabilities do we need? Who will help to make the EMS effective? What training or other resources do we need?
- ***What are our significant environmental aspects and compliance needs?*** What operations / activities need to be controlled? Who needs to be involved to ensure that controls are implemented?

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Consider integrating EMS with your existing:

- ☑ information systems
- ☑ purchasing controls
- ☑ quality procedures
- ☑ work instructions
- ☑ training programs
- ☑ communication efforts
- ☑ reporting systems
- ☑ recruitment, appraisal and disciplinary processes

What are the results of previous audits or other assessments? What does this information tell us about the effectiveness of our organizational structure and how it might be improved?

- ***What are the current responsibilities for environmental management?*** How can we enhance ownership of environmental management across the organization? How can other functions support the EMS? (See next page.)
- ***What are our objectives and targets, including those related to compliance and pollution prevention?*** How will the organizational structure help up achieve these goals?
- ***What quality management and / or other existing management systems exist?*** What roles and responsibilities exist in these management systems? Do opportunities for system integration exist?



*See **Appendix C** for information on process mapping*

Consider **flow charting** your existing environmental management activities. This can help you understand how these processes work and the final product can be a great communication and training tool. Flow charts also can be useful to look at processes such as chemical purchasing and distribution, employee training, and preventive maintenance, among others. **Appendix C** provides information on process mapping.



Hints:

- Build **flexibility** into your organizational structure. Recognize that environmental (and other) management needs will change over time.
- **Communicate** to people what their roles are (as well as the roles of others). One tool for communicating these responsibilities is a **responsibility matrix.** (See the **Tool Kit** in Appendix A for an example of such a matrix.)



Appendix A provides a sample responsibility matrix



More information on resources is found in Appendix F of this Guide

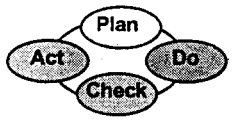
Finding Resources

In most cases, developing and maintaining an EMS will not require large capital outlays. What an EMS will require is **time.** Many smaller organizations find they can make effective use of interns or temporary employees to perform potentially time-consuming EMS development tasks (such as collecting data, drafting procedures, etc.). This allows in-house personnel to focus on more complex EMS development tasks. Also, look for areas where environmental management can support other organizational functions (and vice-versa — see next page).



- ***Objectives & Targets***
- ***Training & Awareness***
- ***Communication***
- ***Management Review***

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How Various Functions Can Support Your EMS

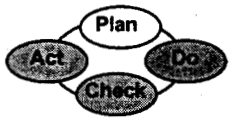
Functions	How They Can Help (Possible Roles)
Purchasing	• Develop and implement controls for chemical / other material purchases
Human Resources	• Define competency requirements and job descriptions for various EMS roles • Train temporary workers and contractors; maintain training records • Integrate environmental management into reward, discipline and appraisal systems
Maintenance	• Implement preventive maintenance program for key equipment • Support identification of environmental aspects
Finance	• 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
Engineering	• Consider environmental impacts of new or modified products and processes • Identify pollution prevention opportunities
Top Management	• Communicate importance of EMS throughout organization • Provide necessary resources • Track and review EMS performance
Quality	• Support document control, records management and employee training efforts • Support integration of environmental and quality management systems
Line Workers	• Provide first-hand knowledge of environmental aspects of their operations • Support training for new employees

For EPA's Performance Track program, organizations must provide appropriate incentives for personnel to meet EMS requirements. See Appendix B for more information.



See the EPA/NSF project report, *Implementing an EMS in Community-Based Organizations* for more ideas on how organizations with limited resources can implement an EMS. Download the report free of charge at www.nsf-isr.org or www.epa.gov.

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Capture the Learning: Structure & Responsibility Worksheet

How do we **define roles, responsibilities and authorities** for environmental management now? Is this process **effective?**	
Who is / should be our EMS **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 ...	

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3.3 Structure and Responsibility [ISO 4.4.1]

What the ISO Standard Requires

The ISO 14001 Standard requires facilities to clearly define, document, and communicate environmental management roles and responsibilities. In particular, one or more person(s) must be designated as the EMS representative, who has the responsibility of making sure that the EMS requirements are established, implemented, and maintained, and for taking the lead in reporting on the performance of the EMS to top management in periodic reviews. Management has the responsibility to provide the necessary resources to make the EMS work, including skilled personnel, technology, and financial resources.

Starting Points

Most of the companies had only one clearly defined role in environmental management—the person(s) responsible for compliance with environmental regulations. Generally, this person was also the designated contact for emergency response, although the actual contact would typically be made through maintenance personnel or shift supervisors. This indicates that it is worthwhile for companies to take the time to clearly identify who is responsible for operations and activities that may have a serious impact on the environment. Companies can also benefit by making sure that everyone knows the key contact people.

Several metal finishers had failed to provide adequate resources (time, technology, and money) to support staff who were assigned responsibility for environmental management (reported in interviews with staff). The scarcest resource mentioned by the metal finishers was time, given that environmental staff typically carry a number of other responsibilities besides environmental management.

Implementation Tips

1) Spell out specific responsibilities in job descriptions for key personnel involved. This should include top management, shift supervisors, and maintenance personnel, in addition to the designated EMS Representative.

2) The EMS Representative does not have to be the Environmental Manager or Engineer for the facility (or the Environment, Health, and Safety Manager). In fact, we found that those facilities who appointed a person with some quality systems background actually made faster

progress in developing and implementing their EMS. This is because the key skill for the EMS Representative is an understanding of the systems-based approach to management, and an ability to work cross-functionally within the organization to get buy-in. Environmental knowledge is another key, of course, but this resource can be obtained from outside of the company as necessary to complete the more technical sections of the EMS (aspect and impact identification, environmental management program, and operational control procedures).

3) Interview shop floor personnel to determine who they currently think is responsible for managing the day to day environmental impacts (including waste hauling, spill cleanup, air emissions). This allows you to check your assumptions about how well informed people are—and to educate as necessary.

Examples

1) To meet reporting requirements under the "Structure and responsibility" section of the standard, the majority of procedures reviewed specified that the Environmental Management Representative was to report to Senior Management or to the EMS Implementation Team. The best examples included a specific time frame for this reporting.

> The Management Representative shall be responsible for reporti ng the performance and continuous improvement strategies to the EMS Grou p on a monthly basis.

2) One procedure emphasized management's critical role in providing resources for the EMS.

> Management provides resources for i mplementation a nd control of the EMS.
>
> The need for more resources is com municated to Senior Management throug h the Environmental Management Representative, Environmental Committee, and department supervi sors.

Conformance Check

The documentation on structure and responsibility provided by the metal finishers was in the form of procedures. While the procedures defined the roles and responsibilities for the EMS, there are other important standard requirements that could not be assessed based on paperwork alone. Review your EMS for the following:

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- Top management (or management) is mentioned in the standard only three times: under policy, management review, and structure and responsibility. One of management's key responsibilities is to provide adequate resources for the EMS. If EMS implementation is repeatedly delayed or the EMS is not being maintained as defined by the organization, management may not be providing adequate resources.

- Be sure responsibilities are communicated throughout your facility. An EMS auditor (internal or external) will interview employees at all levels to determine if they understood the environmental responsibilities of their jobs.

- An auditor of your EMS will also look for evidence of reporting to top management on the EMS performance and how this information was used to make improvements in the EMS.

- Has top management documented their appointment of a specific management representative? This requirement of the standard is often overlooked. The procedures reviewed did describe a position as responsible for EMS development (e.g., EH&S Director, Management Representative) but it was not clear if the procedures were issued by top management. In addition, an auditor of your EMS might note if the EMS representative was high enough in the organization to have the authority to establish, implement, and maintain the EMS.

EMS Links

The structure and responsibility requirements of ISO 14001 pertain to every section of the standard. Roles, responsibilities, and authorities should be defined for each element of the ISO 14001 Standard. A double check for your organization is to look in the Standard where it states, "The organization shall..." and determine who or what group is responsible for developing, maintaining, or revising the particular standard requirement(s). Check to see where that responsibility is

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documented and be sure that responsibility is clearly assigned to an individual. Avoid general responsibility assignments such as:

> Management and administration are responsible for the implementation and maintenance of this [structure and responsibility] procedure and for coordinating and maintaining the procedure on a day-to-day basis.

ELEMENT 3.1

ROLES AND RESPONSIBILITIES

An EMS should establish roles and responsibilities for environmental management. These roles and responsibilities must be clearly and effectively communicated to all employees. In addition, C/U administration should designate an employee who (1) ensures that the EMS is established and implemented; (2) reports on EMS performance over time; and (3) works with others to modify the EMS when necessary.

The size of the C/U and therefore the complexity of the internal structure will have a profound effect on the organization of personnel responsibilities for the EMS. Be cognizant of the size and characteristics of your C/U and plan accordingly when assigning roles and responsibilities. For example, smaller C/Us usually have less hierarchy, more direct lines of communication, and faster decision-making processes. And because staff at smaller C/Us often performs multiple functions, integrating environmental responsibilities with other functions can simplify the EMS structure and minimize use of resources. Medium-sized and large C/Us on the other hand may have significantly more specialized expertise and resources but also more bureaucracy; as a result, they must strive to break down interdepartmental barriers and operate collaboratively to create an efficient and functional EMS.

Implementation: *Procedure 3.1, Roles and Responsibilities*, describes how to assign responsibilities and determine organizational roles for the EMS. The procedure can be implemented, in part, through the Responsibilities Matrix and Organizational Chart. The matrix and chart should be used to plan and assign EMS responsibilities and can also be used to communicate these responsibilities to other people in the C/U. After EMS responsibilities have been assigned, it will be helpful to develop an organizational chart showing responsible employees, lines of communication and reporting, and any hierarchy that may be in place. In addition, an example C/U EMS organization chart has been provided as a possible starting point for developing one for your C/U.

Considerations in assigning and reviewing EMS roles and responsibilities:

- Personnel involved
- Training and resources required
- Results of previous audits
- Improvement of current structure
- Integration with other C/U functions and existing management systems

SAMPLE PROCEDURE ONLY – REVISE AS NEEDED

[C/U Name]	EMS Procedure	3.1
	Effective Date	
	Subject	**Roles and Responsibilities**

Purpose This procedure is used to determine the organizational roles and personnel responsibilities for the [C/U Name] EMS.

Step 1 [C/U Name] Administration will first designate an EMS Manager whose role is to oversee [C/U Name] environmental activities. The EMS Manager and other EMS Participants selected by the EMS Manager are responsible for implementing the EMS.

Step 2 The EMS Manager will develop and assign EMS roles and responsibilities and document them using the Responsibility Matrix and Organizational Chart.

Step 3 The EMS Manager will communicate EMS roles and responsibilities to all employees.

Step 4 The EMS Manager and other EMS Participants will review and update the EMS roles and responsibilities every 12 months.

Step 5 Roles and responsibilities documentation will be retained at the facility for at least 2 years.

Responsible Person: _____

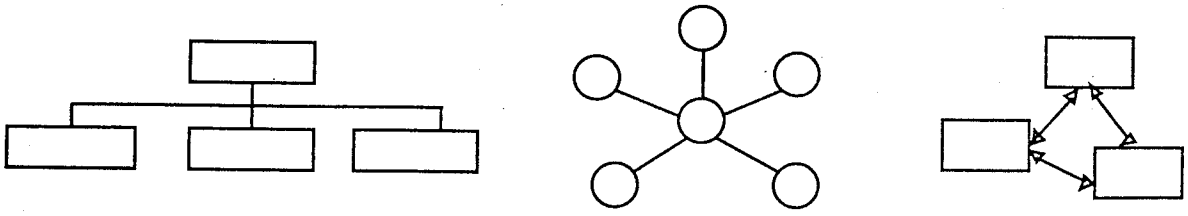
Signature and Date: _____

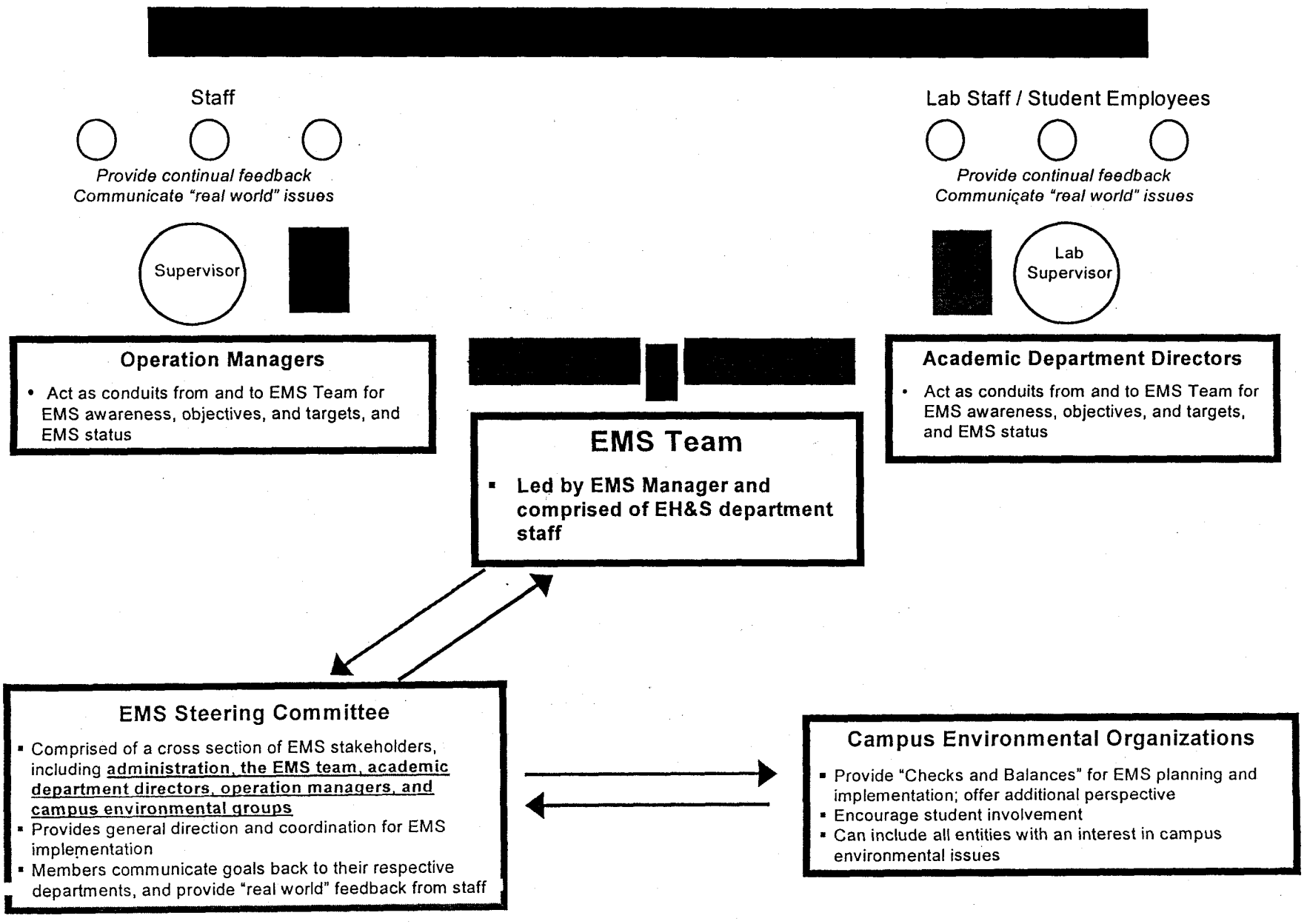
RESPONSIBLITY MATRIX

Facilities and Building Maintenance					Academic Departments				Campus Environmental Groups	
Executive Manager/Director	Zone/Department Managers	Field Supervisors	Field Staff	Student Staff	Department Head	Laboratory Supervisor	Laboratory Staff	Student Staff	Director/President	Members/Student

Management Systems: An Implementation Guide for Small and Medium-sized Organizations, NSF International, 2001

Example Organizational Structure




Staff
Provide continual feedback
Communicate "real world" issues
Supervisor
Lab Staff / Student Employees
Provide continual feedback
Communicate "real world" issues
Lab Supervisor
Operation Managers
• Act as conduits from and to EMS Team for EMS awareness, objectives, and targets, and EMS status
Academic Department Directors
• Act as conduits from and to EMS Team for EMS awareness, objectives, and targets, and EMS status
EMS Team
▪ Led by EMS Manager and comprised of EH&S department staff
EMS Steering Committee
▪ Comprised of a cross section of EMS stakeholders, including administration, the EMS team, academic department directors, operation managers, and campus environmental groups
▪ Provides general direction and coordination for EMS implementation
▪ Members communicate goals back to their respective departments, and provide "real world" feedback from staff
Campus Environmental Organizations
▪ Provide "Checks and Balances" for EMS planning and implementation; offer additional perspective
▪ Encourage student involvement
▪ Can include all entities with an interest in campus environmental issues

CPW ENVIRONMENTAL MANAGEMENT SYSTEM PROCEDURE

The on-line version and secured hardcopy are the controlled documents. The secured hardcopy will be identified by an "Official Document" stamp giving date of distribution. Any and all other documents are uncontrolled. Contact the EMS Program Manager for revision level status.

Effective Date:	**October 1, 2000**	**Page 1 of 2**
Revision: 1	**Identification Number: EMS – 4.4.1**	
Title:	**EMS Structure and Responsibility**	
Prepared By:	**EMS Procedures Subcommittee**	
Reviewed By:	**EMS Management Steering Committee**	
Approved By:	**William E. Koopman Jr., General Manager**	
	John Cook PE, Assistant General Manager	
Date Approved	**August 25, 2000**	

0.0 Requirement **ISO 14001; Sub Clause 4.4.1**

1.0 PURPOSE

This procedure describes how CPW management activities and EMS roles and responsibilities are documented for each associate.

2.0 SCOPE

This procedure applies to all CPW associates.

3.0 DEFINITIONS AND ACRONYMS

Role - The position title of the CPW associate
Responsibility - The duties associated with the title of the employee
Authority - Defined empowerment to require specified tasks and work practices to be conducted
EMS - Environmental Management System

4.0 STRUCTURE and RESPONSIBILITY

CPW executive management establishes the CPW Environmental Policy, participates in the setting of objectives and targets and periodically reviews the performance of the EMS in accordance with the EMS 4.6 Management Review procedure.

4.1 The EMS program manager is responsible for the design, and implementation of the CPW EMS, including the EMS internal audit program.

4.2 Section and department heads and their EMS delegates have authority within their respective departments. This includes approval of the department objectives and targets and periodic review of the performance of the EMS.

Department managers are ultimately accountable for the implementation and performance of the EMS within their department. Department managers play a direct role in establishing and approving objectives and targets, reviewing the performance of the EMS and providing sufficient resources (human, financial and technical). The department managers report periodically to CPW executive management on the environmental performance of their department.

4.3 The EMS Management Steering Committee is responsible for establishing the EMS program, developing the policy and procedures conforming to ISO 14001 requirements, providing guidance and training to departmental EMS implementing committees.

4.4 EMS departmental committees are responsible for developing the EMS program within their department, maintaining EMS documentation and providing training to department associates. The departmental committees have authority over the departmental EMS program.

4.5 For the sake of efficiency, departmental committees may be established to provide EMS assistance to more than one department. Executive management authorizes interdepartmental committees.

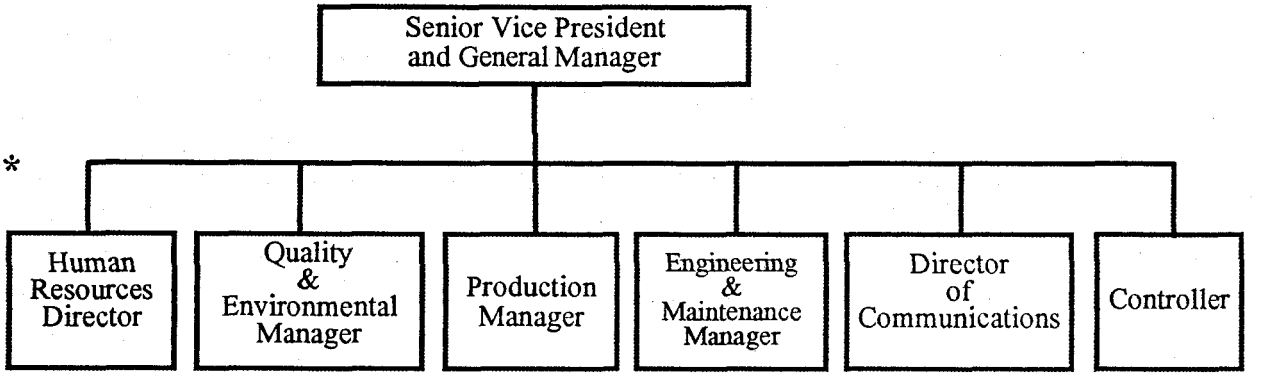
4.6 CPW associates have the responsibility to carry out their job assignments following approved procedures to facilitate effective environmental management. For each level and function that has established environmental objectives and targets, the roles and responsibilities of the associate shall be defined and it shall be documented that the associate has received the appropriate training to accomplish the work assignment.

5.0 RELATED DOCUMENTS

5.1 Environmental Management System (EMS) Manual
5.2 Department Organization Charts
5.3 CPW Personnel Job Descriptions

4.4.1 Structure & Responsibility

Alumax of South Carolina (Mt. Holly) has defined, documented, and communicated the roles, responsibilities, and authority of personnel in order to facilitate effective environmental management. Each relevant management position is shown in the organization chart below. Descriptions are provided for the actual roles, responsibilities, and authority for senior management and other key personnel. The descriptions designate specific responsibility for the provision of resources essential to the implementation and control of the environmental management system.



Sr. Vice President

The Senior Vice President is responsible for development of an environmental policy and approval of resources needed to support the environmental management system (EMS).

Managers

Each manager at Mt. Holly is responsible for overall environmental performance and for providing human, physical (e.g., facilities, equipment, technology) and financial resources essential to implementation and control of the environmental management system for their area of responsibility. Managers shall ensure environmental programs are supported and environmental control and compliance in plant operation is maintained by site management review. Environmental issues shall be reviewed at management review and plant staff meetings. The results of these reviews shall be incorporated into the environmental planning process which includes establishment of objectives and targets.

Environmental Superintendent

The Environmental Superintendent is responsible for developing and implementing an EMS and monitoring/reporting to appropriate regulatory agencies and/or interested parties.

4.4.1 Structure & Responsibility (cont'd)

Quality Engineer

The Quality Engineer has been appointed by top management as the Management Representative for the environmental management system at Mt. Holly. He/she shall have responsibility and authority for:

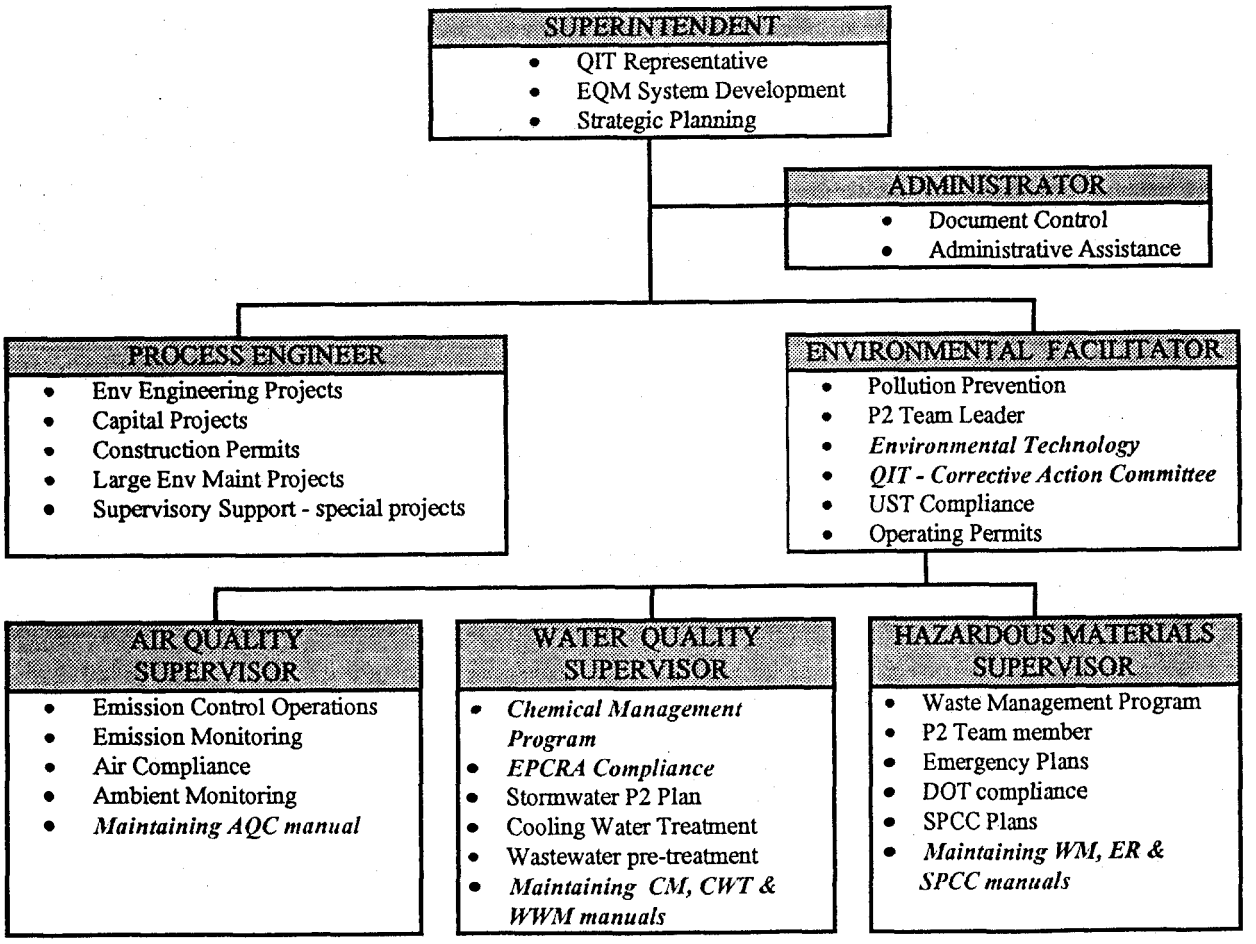
a) ensuring that environmental management system requirements are established, implemented, and maintained in accordance with the ISO 14001 International Standard:

b) reporting on the performance of the environmental management system to top management for review and as a basis for improvement of the environmental management system.

c) providing for maintenance and distribution of the EQM manual.

Environmental Staff

The Environmental Department staff is responsible for development and implementation of environmental management programs within the scope of each members departmental responsibility. Each member is responsible for reporting performance to the Superintendent and other departments' management that is associated with their program. They are also responsible for assuring regulatory compliance (including external reporting) and conducting environmental assessments. The environmental department management organization chart is shown below.



Pollution Prevention Team

The Pollution Prevention (P2) Team is a team formally chartered for the purpose of monitoring environmental system activities in an effort to improve communication among departments and employees, assess the aspects and impacts of the facility, and initiate preventive and corrective action if necessary. The P2 Team is responsible for addressing plant-wide environmental issues in an effort to identify areas for improvement, detect problem situations which may require attention, or initiate corrective action on items not in compliance with known standards or procedures. This team shall approve all actions and activities undertaken by subcommittees derived from P2 membership. This team shall have the responsibility for communicating changes to the environmental management system.

Each department shall have a designated representative which will act as a liaison for communication between the department and the P2 team. *The following table provides a list of the designated areas within the plant that is represented by a member of the P2 team.*

Areas of Responsibility for P2 Membership
(Team Leader)
Warehouse
Cast House
Quality/Lab
Engineering
Environmental
Human Resources
Potline & Potline Services
Maintenance - mechanical & electrical
ISO 14001 Management Representative
Carbon Plant (Green, Baked, Rodded, Cathode Repair)
Purchasing, Traffic, Accounting, MIS, Admin Bldg. & Contractors

A roster of current P2 Team members will be maintained on the plant "Teams" network application.

Members on the P2 Team may serve on an ad-hoc subcommittee if needed to address specific environmental issues necessary to meet the requirements of the environmental system or to perform various tasks as a measure of continuous improvement.

Emergency Response Team

An Emergency Response team shall be formally chartered to prepare the plant for, and provide response to, all conceivable emergencies (fire, confined space rescue, HazMat spill, medical or natural disaster). Team responsibility will include development of contingency plans to minimize potential impact on the environment due to release of hazardous materials in the event of an emergency. The team structure shall be designed to maintain a "shift team" of 10 - 12 members per shift with members representing the major Production areas (Cast House, Potline, Carbon Plant), Maintenance, Safety/Security, Environmental and Industrial Hygiene.

Project & Process Engineers

Project and Process Engineers are responsible for improving plant operations and efficiency through development and implementation of capital projects including purchase, design and replacement of existing equipment and revisions to plant layout.

Controller

The Controller is responsible for developing/ maintaining accounting procedures for tracking costs and benefits of environmental activities and capital expenditures for pollution control. ***The Controller also shepards the Strategic Planning function by directing the plant's strategic planning process to ensure coordinated planning that meets Mt. Holly's long term business needs.***

Director of Communications

The Director of Communications has responsibility for the Purchasing Department. Purchasing is responsible for supporting EMS policies designed to control incoming chemical products, supplies and materials to minimize the quantity and toxicity of chemicals on-site and to minimize waste associated with packaging materials.

Employees

All employees of Alumax of SC have environmental responsibility to support the overall environmental management system. At a minimum each employee is responsible for performing his or her job in accordance to policies and procedures established to control impact on the environment.

Other Resources

Financial - Financial resources to support the EMS are provided through the operating budget process. Systems shall be developed and maintained to track cost and benefits of environmental activities and waste management as well as for costs for pollution control capital projects and pollution abatement.

Physical - Physical resources including equipment and new technology essential to implementation and maintenance of Mt. Holly's environmental policy shall be provided in balance with economic needs. Physical resources are requested by one of the following methods:

a) **CPER** (Capital Project Evaluation Request) - requests are submitted to Engineering for new equipment costing over $15,000.

b) **"Nonrecurring Maintenance Budget Request List"**- in addition to nonrecurring maintenance, modification to upgrade equipment can be included. (Note: If this modification will extend the life of the asset or increase its utilization capability it will be transferred to a capital request). Maintenance Budget Requests are usually required to be submitted in June of each year to Maintenance for approval.

c) **Production Improvement** - operating account (cost center)-5315 shall be used for purchase of equipment (less than $15,000) or modification to upgrade existing physical resources.

4.4.2 Training, Awareness and Competence

Training needs assessments shall be conducted annually by each department manager/superintendent. * A training plan shall be documented as a result of the needs assessment.

Procedures shall be established and maintained to ensure employees are aware of:

a) the importance of conformance with the environmental policy and procedures and with the requirements of the environmental management system;

b) the significant environmental impacts, actual or potential, of their work activities and the environmental benefits of improved personal performance;

c) their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirements of the environmental management system, including emergency preparedness and response requirements;

d) the potential consequences of departure from specified operating procedures.

Training considerations shall include training for employees whose work may create a significant impact on the environment, new employees, temporary employees, contractors, and janitors. These programs must comply with that required by regulations. Procedure MH-EV-S-006 should be referenced to ensure required training is planned.

All employees shall be trained to develop awareness and competency in the following with refresher training provided as needed. When employees change departments, they must be trained on the environmental aspects of their new jobs and the work practices to control environmental impact within 30 days.

- Environmental Management System/ ISO 14000 (general awareness)
- Work practices to control significant environmental aspects
- Waste Minimization / Pollution Prevention
- Emergency Response Awareness

All employees shall be competent to perform tasks which can cause significant environmental impact. Competency will be established on the basis of appropriate education, training and/or experience.

4.4.3 Communication

Internal

Mt. Holly shall establish and maintain the following methods and procedures for communication between the levels and functions:

- P2 TEAM - Pollution Prevention *(P2)* Team members shall be primarily responsible for conducting environmental communications throughout the plant.
- MEETINGS - Routine meetings will be held every two weeks for updating communications between all managers and superintendents in the plant. Team meetings for the*P2* Team will be held according to schedule (about monthly). Pertinent information from these meetings shall be communicated to departmental staff who will pass on information to other departmental employees.
- WRITTEN REPORTS - Written Environmental Reports shall be made monthly and distributed to all Environmental members and management. WasteMin/*P2* Status Reports shall be made monthly and on an annual basis and distributed to department superintendents, P2 Team members, Corporate and other Alumax primary aluminum plants. Annual Environmental Reports which provide a complete account of environmental performance, activities, and regulations shall be distributed to plant management and corporate.
- E-MAIL & NEWS*MONITOR* - Shall be used to communicate plantwide.

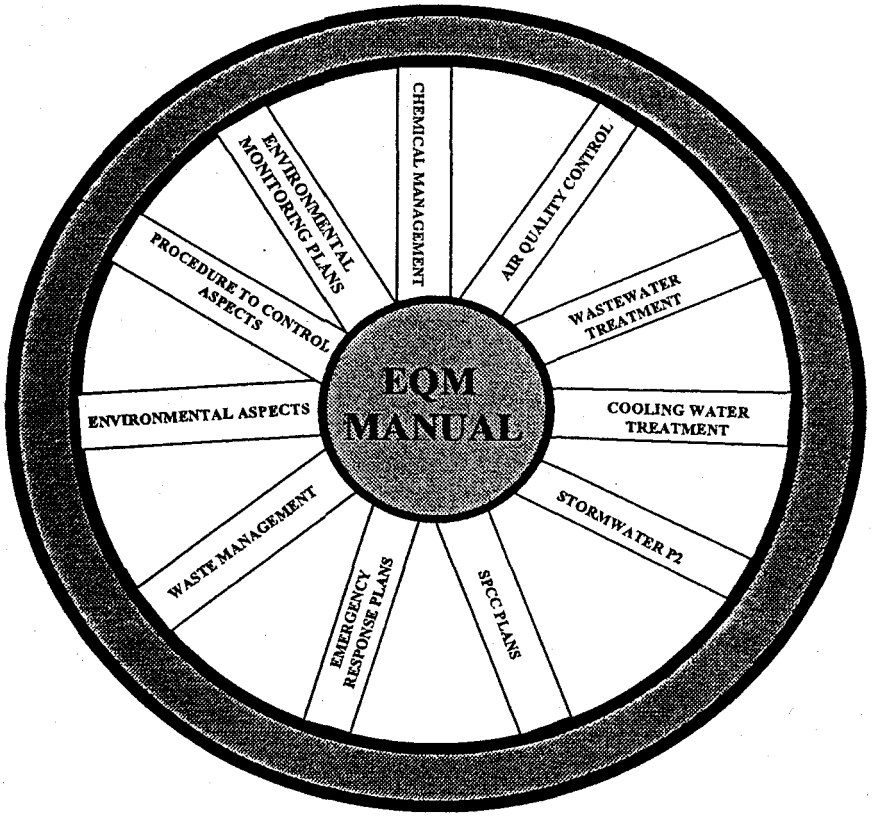
External

The following shall be utilized for communications external to the plant:

- REGULATORY AGENCY - Environmental staff members shall be responsible for maintaining communications on their area of responsibility with DHEC.
- NEWS MEDIA - The Plant Manager or his/her designee shall be responsible for all communications with the news media.
- LEPC - The Hazardous Materials Supervisor is the designated representative to the local emergency planning committee.
- REQUESTS - Requests from the public concerning environmental (with exception to the news media) shall be first directed to either the Quality / Environmental Manager or The Environmental Superintendent. All requests will be evaluated and response provided to the requester either granting their request or explanation of why it will not be granted. These communications * shall be documented in the environmental period report.
- COMMUNITY - External communications shall be made to the community on at least an annual basis to promote environmental awareness and *P2* via the newspaper and by participation in community Earth Day projects such as Kids Who Care "Nature Scope". Consideration shall be given to reporting on the plant's environmental performance for these annual community reports. Environmental presentations and tours will be provided to local school groups upon request, when feasible.

4.4.4 Environmental Management System Documentation

Documentation of the management system shall be accomplished using the Environmental Quality Management (EQM) Manual, specific environmental management program manuals, and departmental procedures. Mt. Holly documentation shall be developed by the Environmental Department in accordance with the Environmental Management System Illustration shown below.



EQM Manual

The design of the EQM Manual shall identify all areas of environmental responsibility and describe the structure and system used to manage these responsibilities. The management system shall be designed to integrate quality standards with sound environmental management practices. The EQM Manual shall be used to establish a standard for documentation and management control.

Environmental Program Manuals

Program manuals shall be developed for the categories of environmental concern listed on the illustration as a supplement to the EQM Manual. Full documentation for each environmental program shall be included within each program management manual. Program manuals shall be designed to be used for program management, operation, training*, information resource, and auditing.

Manual Organization

The Environmental Department environmental management manuals shall be developed and maintained with the following specified documentation.

EQM MANUAL
• Environmental Management System
• Document Control
• Corrective & Preventive Actions
• Management Review
WASTEWATER MANAGEMENT MANUAL
• Sewage Treatment Operation
• Process Wastewater Management
• Spray field requirements (closure)
• Groundwater monitoring
COOLING WATER TREATMENT MANUAL
• Cast House Systems
• Compressor room cooling water system
• Rod Shop cooling water system.
• Green Carbon system
WASTE MANAGEMENT MANUAL
• Asbestos Abatement Program
• Spent Potliner Management Plan
• Drum Management Program
• Solid Waste Management Program
• Used Oil Management Program
• Solvent Management Program
• Waste Minimization Plan
CHEMICAL MANAGEMENT MANUAL
• Chemical Product Accounting Plan
• EPCRA Compliance Plan
• Toxic Use Reduction Plan
• Chemical Storage Plan
• Ozone Depleter Compliance Plan
• Greenhouse Gas Reduction Plan

AIR QUALITY CONTROL MANUAL
• Dry scrubber systems operation
• Dust collector systems operation
• Pot hood maintenance program
• Filter bag quality control program
• Emission Monitoring
• Compliance Reporting
• Ambient Monitoring Plan
STORMWATER P2 PLANS *
• Written Plan in accordance to permit
• Monitoring Plan / procedures
• Annual site assessments & SWPP Revision
SPCC PLANS *
• Spill potential assessment (Petroleum Prod.)
• Spill prevention / control provisions
• Spill contingency plans & procedures
• UST Management Plan
EMERGENCY PREPAREDNESS & RESPONSE PLANS
• RCRA Contingency Plans (hazardous waste)
• OSHA Action Plan (including Evacuation)
• Preparedness & Prevention Plans
• Medical emergency preparedness/ response
• Fire Prevention /Cessation
• HazMat spill/ release response
• Communications

4.4.4 Environmental Management System Documentation (cont'd)

Departments

Each department shall document their significant environmental aspects, identification of the methods used to control impact from each aspect, and procedures used to control impacts.

4.4.5 Document Control

All departments shall follow the Mt. Holly Quality System guidelines established for plantwide document control. Specific requirements shall be maintained in the Mt. Holly Quality Assurance Manual.

4.4.6 Operational Control

Operations and activities associated with the identified significant environmental aspects (SEA) shall be identified. Each department shall plan these activities, including maintenance, in order to ensure they are carried out under specified conditions by:

a) establishing & maintaining documented standard procedures to cover situations where their absence could lead to deviations from the environmental policy, objectives and targets;
b) stipulating operating criteria in the procedures;
c) establishing & maintaining procedures related to the SEA of supplies and services used by the plant and communicating relevant procedures and requirements to suppliers and contractors.

4.4.7 Emergency Preparedness and Response

Procedures shall be established and maintained at Mt. Holly for Emergency Preparedness and Response. The procedures will identify the potential for accidents and emergency situations and the corresponding response. The procedures shall also consider the prevention and mitigation of any environmental impacts associated with accidents or emergency situations.

Procedures developed to encompass all departments at Mt. Holly shall be considered "plant" procedures and shall be the responsibility of the Emergency Preparedness and Response program manager. The Emergency Preparedness and Response program manager shall be assigned to the Environmental Department.

All Emergency Preparedness and Response procedures shall be maintained in the Emergency Preparedness and Response Plans manual. Revisions to this manual and communication of the revisions will be the responsibility of the Emergency Preparedness and Response program manager. This manual shall be made available to all plant personnel.

Additional procedures shall be established and maintained at the department level for Emergency Evacuation Plans and Tornado Preparedness Plans. Each department manager/superintendent shall assess the need for other department specific procedures and coordinate the development of procedures with the Emergency Preparedness and Response program manager to ensure consistency and adequacy with plant policy and/or regulatory requirements.

Emergency Preparedness and Response procedures shall be periodically tested, where practical. Procedures shall be reviewed after the occurrence of accidents or emergency situations and revised where necessary.

SECTION: 4.5	CHECKING AND CORRECTIVE ACTION	PAGE: 1 of 3
WRITTEN BY: C. Kirkland	REVISED BY: *P2 Team Subcommittee*	REVIEWED BY: *P2 Team*
DATE WRITTEN: 06/10/96	DATE REVISED: *3-3-97*	DATE REVIEWED *3-13-97*
REV. NO.: *2*	APPROVED BY: *Paul Campbell*	DATE APPROVED: *3-14-97*

4.5.1 Monitoring and Measurement

A system shall be established for measuring and monitoring actual performance against Mt. Holly's environmental objectives. Each department shall ensure records are maintained or reviewed on a regular basis to track key indicators of performance to achieve its environmental objectives.

The Environmental Department shall establish procedures for each environmental management program which shall summarize all relative monitoring, including compliance monitoring specified in environmental permit conditions. In addition to these monitoring procedures each environmental management program shall develop and maintain documented procedures for other system monitoring checks to assure proper operation and/or objectives.

Monitoring Equipment and Records

Monitoring equipment shall be calibrated and maintained and records of this process retained in accordance to Mt. Holly's Quality System (section 4.11 of the Quality manual). Each department utilizing inspection, measuring, and test equipment shall:

a) Determine the measurements to be made and the accuracy required, and select the appropriate equipment that is capable of the necessary accuracy and precision.

b) Identify, calibrate and adjust prior to use or at a prescribed interval against certified equipment with a known, valid relationship to national standards, their equivalents or documented equivalents when no national standard exists.

c) Define the process employed for the calibration of equipment, including details of equipment type, unique identification, location, frequency of checks, check method, acceptance criteria, and the action to be taken when results are unsatisfactory.

d) Identify critical inspection, measuring , and test equipment affecting the quality of cast product with a suitable indicator or approved identification record to show the calibration status.

e) Maintain calibration records for each measuring device. These records are to include date of calibration and person performing adjustments. Each department is responsible for maintaining its records. (Records may be incorporated into a computerized preventive maintenance or work order program.) Records are to be kept in accordance with Section 4.16 of the QA manual - Record Retention Requirements.

Naval Aviation Depot, CA

ISO 14001 Procedure

Title	Document Effectivity	Status
Structure and Responsibility	First Issue Date 01/22/1999 Revision Date 05/03/1999	Issued
EMS Procedure No	**EMSMR**	Rev
EMSP441	Melito M Barrera/NI/NADEP	2

Purpose

To establish structure, responsibility and accountability for the operation and maintenance of the EMS.

Scope

This procedure covers the roles internal to the NADEP organization associated with the operation and maintenance of the EMS.

Responsible Party	Responsibilities
EMS MR	• Ensures that EMS procedures are established, implemented and maintained in accordance with the most current version of ISO 14001 and other NADEP EMS objectives. • Ensures that the Environmental Policy is made available to NADEP employees and other interested parties.
OUMR	• Ensures that EMS requirements for the OU are implemented and maintained.
OUM	• Appoints an OUMR to act as the OU representative and point-of-contact for EMS activities. • Approves objectives and targets for the OU.
EPO	• Reports overall environmental compliance program status to the EMS. • Assigns roles and responsibilities for ER&P. • Chairs and participates in the EIT.
ESC	• Ensures that resources essential to the implementation and management of the EMS are provided. • Conducts management review of the EMS (see EMSP 46). • Ensures that the Environmental Policy is shared with stakeholders, customers, neighbors and others during the course of regular duties.
ITSM	• Provides hardware and software support as needed to support the EMS.
NADEP Base Operations Manager	• Appoints EMS MR(s) to administer the EMS.
EIT	• Meets at least once each EMS cycle (see EMSP 46) to evaluate

	proposed SEA improvement projects (see EMSP 431).
All NADEP Employees	• Practice prevention of pollution whenever and wherever possible. • Adhere to applicable environmental legislative, regulatory, permit, and other requirements. • Have knowledge of the Environmental Policy. • Utilize, develop and produces products that minimize environmental impacts to the extent economically and technologically feasible within the parameters of business operations and imperatives.

PROCEDURE

1. The EPO will:

a. Manage an environmental compliance program to address relevant environmental legislative, regulatory, permit and other requirements.

b. Manage a pollution prevention program. The pollution prevention program personnel shall participate in the EIT.

c. Support EMS implementation efforts by providing environmental expertise and resources.

2. The EMS MR will:

a. Ensure that the Environmental Policy is available on the NADEP Intranet.

b. Ensure the EMS Manual is maintained and updated on the DCRS.

c. Coordinate an internal EMS audit once each EMS cycle (see EMSP 46) to ascertain the performance of the EMS.

d. Accept objectives and targets for implementation that meet EMS conditions and procedures.

e. Represent the organization and coordinate logistics during external EMS audits.

f. Delegate responsibilities, as needed, to represent the EMS MR in order to facilitate timely accomplishment of EMS MR duties, and record the act of delegation on an Internal Communication form.

3. The OUM will:

a. Appoint an employee of the OU to be OUMR, and list the collateral duties of the position.

b. Approve objectives and targets on EMP forms.

4. The OUMR will:

a. Review the EAs once each EMS cycle (see EMSP 46).

b. Coordinate the selection of objectives and targets and how they will be accomplished.

5. The ESC will:

a. Ensure that the organization considers the EMS in the preparation of official bids, advertisements and other relevant documents.

6. The NADEP Commanding Officer will:

a. Sign the Environmental Policy.

7. General Guidance:

a. For the purposes of the EMS, the ESC will be considered to consist of the Commanding Officer, the Executive Officer, the Production Officer, the Production Manager and the Plant Manager. A quorum is any three.

References

ISO 14001:1996, Section 4.4.1

EMSP 431 Environmental Aspects

EMSP 46 Management Review

Document Edited By:
Form Rev 1.0.2 15 APR 2000

regulations, ordinances, and other requirements[1] applicable to the people, activities, and facilities under their control and forward them to the Manager of Legislative Affairs in the Division of Policy and Legislation.

The Manager of Legislative Affairs shall maintain this archive of relevant environmental laws, regulations, ordinances, and other requirements in accordance with the Documentation, Document Control, and Records requirements of this manual.

The Manager of Legislative Affairs shall continually monitor and review selected sources of information for new legislation proposed in the Congress of the United States and the Virginia Legislature, and for new regulations and changes proposed by the U.S. Environmental Protection Agency, the Virginia DEQ, and other federal and state agencies, applicable to the people, activities, and facilities of the DEQ, and shall forward such information to the Director of Administration and the Regional Directors, as appropriate.

The Regional Directors shall continually monitor and review selected sources of information for new environmental ordinances and changes proposed by the municipalities within their regions and shall forward such information to the Manager of Legislative Affairs.

The Environmental Manager shall periodically monitor and review identified other requirements to determine their ongoing consistency with DEQ's Environmental Policy and shall apprise the Director of Administration and/or Regional Directors of any new requirements or conflicts brought about by changes in other requirements.

The Director of Administration and each of the Regional Directors, shall at least annually

- Determine which laws, regulations, ordinances, and other requirements their area of DEQ is *prima facie* in compliance with;
- Determine which laws, regulations and other requirements their area of DEQ is *prima facie* not in compliance with; and
- Establish management plans to achieve full compliance.

These management plans shall be submitted to the Chief Deputy who shall ensure that they are effectively carried out.

4. Structure and Responsibility

The EMS Program Team, a permanent program team with members appointed by the Director of Administration and the Regional Managers and with at least three representatives from the Executive Management Team (EMT), shall be responsible for establishing and maintaining the EMS and ensuring its conformance with ISO 14001 and DEQ's E^3 Program.

[1] Other requirements are those charters, principles, guidelines, codes of conduct, or by-laws of organizations that DEQ supports or is affiliated with in any way as well as the requirements imposed by federal grants.

The EMS Manager[2] shall chair the EMS Program Team, ensure the day-to-day maintenance of the EMS, and be accountable to the Director for the performance of the EMS.

The Director and the EMT shall be responsible for providing the resources essential to the implementation and control of the EMS.

A Management Review Team, comprised of the Director and members of the EMT, shall annually in November review the EMS for suitability, adequacy, and effectiveness.

5. Training, Awareness, and Competence

5.1. General Awareness Training

All DEQ employees shall receive general awareness EMS training. In the initiation of the EMS during 2001, Director of the Office of Pollution Prevention shall prepare a core general awareness training package and deliver this training, with the assistance of other EMS Program Team members, to all of DEQ's approximately 900 employees. The general awareness training subjects shall include the Environmental Policy, the potentially significant environmental impacts, the objectives and targets, and employees' roles and responsibilities in conforming with the requirements of the EMS.

Thereafter, the DEQ Training Manager shall ensure that EMS general awareness training shall be embedded in the overall DEQ training curriculum being developed by the DEQ Training Committee.

5.2. Significant Impact Training

Concurrent with its determination in February of each year as to which of DEQ's environmental aspects are potentially significant environmental impacts, the EMS Program Team shall identify the training needs of personnel whose work can cause a significant impact on the environment, determine the criteria for personnel competence, and recommend timeframes for delivery of training to the DEQ's Training Committee. These training needs shall become a part of the Environmental Objectives and Targets for the upcoming fiscal year.

The Training Committee shall determine the means and methods for delivery of this significant environmental impact training subject to DEQ's overall mission requirements.

5.3. Training Records

Records of training related to the EMS shall be established and maintained by the DEQ's Training Manager in accordance with Virginia's record retention policy for state agencies.

---

[2] The EMS Manager responsibility shall be carried out by the Director of Pollution Prevention & Compliance Assistance (Lead), Director of Enforcement Coordination, Director of Administration, and Director of General Services.

Responsibility Matrix

Legend:
L = Lead Role
S = Supporting Role

	Plant M'gr	EHS M'gr	HR M'gr	Maintenance	Purchasing / Materials	Engineering	Production Supervisor(s)	Finance	EMS Mg't Rep.	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		
Maintain EMS records (training, etc.)		L								
Coordinate EMS document control efforts					S				L	

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Training & Awareness

4.4.2

Section I

"Training, Awareness, & Competency" from NSF Guide

"Building Organizational Support" from EPA IEMS Guide

"Training, Awareness, & Competency" from NSF Metal Finishers Guide

"Training" from Colleges and Universities EMS Guide

Section II

Charleston Public Works Training, Awareness, & Competency Procedure

Naval Aviation Depot North Island Training, Awareness, & Competency Procedure

University of Missouri - Rolla Training Programs for EMS

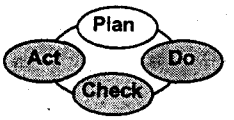
Virginia Department of Environmental Quality Training, Awareness, & Competency Statement

Sample EMS Training Log

KY P2 Center Training Guide

DPPEA's Gov Course Training Schedule

Comments:



Training, Awareness and Competency

Building internal capabilities



Implementing and maintaining an EMS involves <u>everyone</u>

Here are two excellent reasons for training employees about environmental management and your EMS:

- Every employee can have potential **impacts** on the environment, and
- Any employee can have **good ideas** about how to improve environmental management efforts.

Each person and function within your organization can play a role in environmental management. For this reason, your training program should cast a wide net. Every employee and manager 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 <u>not</u> following EMS requirements (such as spill, releases, fines or other penalties).

Reasons for <u>Training</u>:

- ☑ motivation
- ☑ awareness
- ☑ commitment
- ☑ skills / capability
- ☑ compliance
- ☑ performance

All personnel should receive <u>appropriate</u> training. Such 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.



An example of a trainin log is provided in the Tool Kit (see Appendix A)

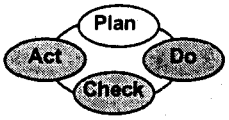
Getting Started:

- A critical first step in developing your training program is **assessing your training and skill needs.** In assessing these needs, you should consider both **general** and **specific** needs (e.g., "What EMS procedures affect Joe's daily work and what happens if they aren't followed?" "What environmental impacts might Joe's work cause?" "What broader understanding of environmental issues and our EMS does Joe need?")
- Look at the **training you conduct already**, for compliance with environmental and health and safety regulations and other purposes. You may find that your existing training efforts go a long way towards satisfying the requirements for the EMS. Competence might be established on the basis of regulatory-required training, in some instances.



- ***Environmental Aspects***
- ***Legal/Other Requirements***
- ***Structure & Responsibility***
- ***Operational Control***
- ***Records***

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Milan Screw Products found that it could provide a great deal of its training during "brown bag" lunches, during which employees bring their lunches, participate in a training session, and remain "on the clock" for the lunch period.

Key Steps in Developing a Training Program

Step 1:	Assess training needs & requirements
Step 2:	Define training objectives
Step 3:	Select suitable methods and materials
Step 4:	Prepare training plan (who, what, when, where, how)
Step 5:	Conduct training
Step 6:	Track training (and maintain records)
Step 7:	Evaluate training effectiveness
Step 8:	Improve training program (as needed)



Hints:

- Because of the level of effort involved in training, this is one EMS element where you don't want to start from scratch. Many employees may be qualified on the basis of their experience and previous training. (Keep in mind that all training should be documented.) Since some employees might require training on how to operate equipment safely, **on-the-job training** certainly can play an important role. **Computer-based training** also may be an option, especially for employees who spend much of their time in the field.

- **Plan and schedule** training opportunities carefully. While finding enough time for training can be a challenge, you might find creative ways to make "more time" (see "tip", above left). Use safety meetings, staff meetings, and tool box meetings to provide training and reinforce key messages.

- New employees can pose a significant training challenge. Consider developing an EMS training package for **new employee orientation**. Even better, videotape one of your current EMS training courses to show to new employees.

- In reviewing training needs, don't forget to consider the qualifications and training needs of your **environmental manager** and your **trainers.** Professional certification programs may be appropriate for certain functions.

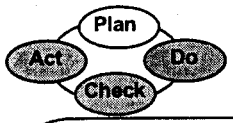
- If the organization uses **temporary or contract workers**, assess their training needs as well.

- Factor EMS skills requirements into your **recruiting, selection**, and new employee **orientation** processes.

Training Resources:

- ☑ internal trainers / experts
- ☑ consultants
- ☑ community colleges
- ☑ vendors / suppliers
- ☑ customers
- ☑ technical / trade / business associations
- ☑ self-study or study groups
- ☑ training consortia (teaming with other local companies)
- ☑ computer-based training

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When Training Might Be Needed:

- ☑ New employee is hired
- ☑ Employee is transferred to a new job
- ☑ Individual doesn't follow procedure / instruction
- ☑ Procedures are changed
- ☑ New process, material or equipment is introduces
- ☑ Company changes objectives and/or targets
- ☑ New regulation affects organization's activities
- ☑ Job performance must be improved

- Establishing **competency** for various tasks can be a challenge. Competency criteria for jobs that can cause significant environmental impacts should be as objective as possible.

  One informal method for assessing competency is to question employees in critical functions as to how they perform various aspects of their jobs (e.g., "Show me how you..."). Use responses to determine whether they have the requisite skills and understanding to perform the job safely. This can help you gauge whether additional training might be needed.

- Consider visual **"job aids"** to supplement training or help establish competence. Examples of job aids include written or pictorial job procedures, decision tables or flow charts posted at the workstation.

- Finally, some organizations have been successful in **blending environmental awareness training into existing safety training** programs. This can be particularly effective where safety training is mandated (i.e., by regulation or other organizational requirements) and has strong management support.

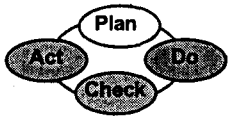
A Few Thoughts About Adult Learning

- Adults need the opportunity to integrate new ideas with what they already know.
- Information that conflicts sharply with existing beliefs or has little conceptual overlap with what is already known is acquired more slowly.
- Adults prefer self-directed learning and want to have a hand in shaping the training program.
- Adults have expectations. It is important to clarify these up-front.
- Adults prefer active participation to straight lecture.

- Adapted from "Adults Learning: What Do We Know For Sure" (Training Magazine, June 1995)

For EPA's Performance Track, organizations must provide specific training for employees whose responsibilities relate directly to achieving objectives and targets and legal compliance.
See Appendix B for more information.

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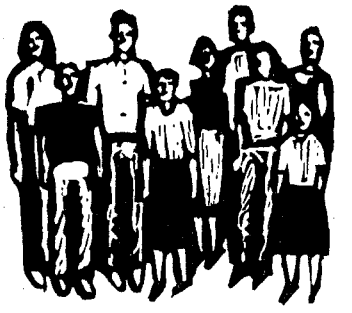


Capture the Learning: Training, Awareness & Competence Worksheet

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 ...	

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MODULE 8: BUILDING ORGANIZATIONAL SUPPORT



Effective organizational support is important to achieving long term success for your IEMS. This module will cover training, documentation, stakeholders and communication.

Training to Get the Job Done

It's very important that people receive the training needed to get work done in a way that is consistent with your objectives. Training is needed both in technical work and for general awareness on the part of all employees. The following are some examples of areas where training is needed:

- legal requirements,
- ability to recognize new problems,
- technical work 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 IEMS and its objectives

In addition to environmental or worker health and safety training that your company may currently carry out, you will have specific training requirements associated with significant environmental aspect operational controls, as your IEMS develops. Module 6 addressed the training for that phase of your

☞ **Tip**

Don't overlook the need for on-going training when experiencing employee turn-over. Be sure that new employees are trained soon after they arrive.

IEMS. Training plans developed during completion of that module should be integrated with the training identified in this module.

Go through the Action Steps listed below and use Worksheet 8-1 to help you identify, plan for and track the training needed to assist in developing and putting your IEMS in place. 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 IEMS.

Action Steps

1. Identify all job functions that affect the environment. Small companies may wish to identify individuals. Identify who is responsible for employee health and safety.

2. Identify the training and type of training these people currently receive that relates to environmental, including health and safety, concerns.

3. Determine if IEMS education could be included in this training or whether there should be special IEMS training, at least in the beginning.

4. Identify training materials or programs available outside your company. Some places to check include:

- Trade Associations
- Small Business Association
- EPA materials
- State Department of Environmental Protection
- Suppliers
- Certified Contractors

Worksheet 8-1: Training Plan

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

Documenting Your Work

When undertaking a new activity like IEMS development, documenting discussions, plans, targets, and programs is crucial. Documentation ensures that no information is lost, and lets you track your performance. Much of this documentation will become the content for your company's IEMS Manual. The companion document to this guide, the *Company Manual Template*, provides a template for your own documentation development. Documentation is important to the success of your IEMS for several reasons:

- Word-of-mouth information is rarely communicated consistently, whereas written information is more likely to be constant from person to person and over time.
- Creating documentation helps you assess the progress of your IEMS. Some inconsistencies show up only as you commit your ideas to paper, and having a record allows you to check on progress and evaluate results.
- Documentation is vital to maintaining consistency in an IEMS over time and from department to department. In most companies, change is a fact of life: new products are developed, the company grows, employees change positions or leave the company. Accurate documentation will make it much easier to maintain an effective and flexible IEMS during these changes.

Resource

Review the *Company Manual Template* for sample documentation to help you develop your own IEMS Manual.



Experience has proven the value of documenting meetings, decisions, and study results, and of making that documentation accessible to those who need it.

What is Documentation?

The term "documentation" has many different interpretations. The term can refer to any or all of the following:

- instructions for doing something;
- records of what was done;
- policies developed;
- printed matter that is given or sent to clients, regulatory agencies, customers, and the public; and
- any electronic copy of the items above.

How a company interprets "documentation" will depend on its particular experience. For example, documentation could include environmental impact statements, process manuals, or even the local newspaper that reports your company's activities. Other examples might include environmental training records and OSHA manuals. All of the work completed to develop your IEMS also provides documentation.

☞ Tip

Documentation is usually the single most overlooked administrative procedure in most companies, but it can play a vital role in EMS development. Determining what you need from your documents, both for future reference and to teach procedures to others, will help you understand the overall needs that you want your IEMS process to meet.

How to Develop Your Documentation

The basic steps in preparing IEMS 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,

☞ Tip

Remember that you will not finish most of the modules in this Guide the first time through. You will probably overlook items that will be useful for your IEMS documentation during your first search. Simply add items as you think of them later in the process. Whoever is in charge of documentation will therefore need to plan for later additions.

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 companies use the same format for all their documents. An example of existing documentation might be a quality plan or tracking reports.

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

You will probably have to compromise in producing documentation that meets your needs while also meeting your budget. Here are some questions to help you determine what fits your needs:

- How can you extend those 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 format for all documents.

Before developing your IEMS documents, plan the format (document and page appearance) for the documents to be created. If a company standard exists, use it. If not, the need for IEMS 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!

Step 4: Prototype each document.

Prototyping means visualizing what you will need in the document and creating an outline for it before you actually have information to fill in. This practice is useful not only for document preparation, but for the IEMS process as a whole. As you visualize what you will need in the document, you will gain understanding about what you will need from the process of developing your IEMS. It's a way

of "outlining" your IEMS process as well as designing documents.

Who should do the prototyping? The best people to do this are the people who will use the document. Involving them in the process gives document users the power to develop documents they will actually use – effective documents.

The following questions will help your "prototypers" design documents. Consider these questions for each document you identify as necessary for your company.

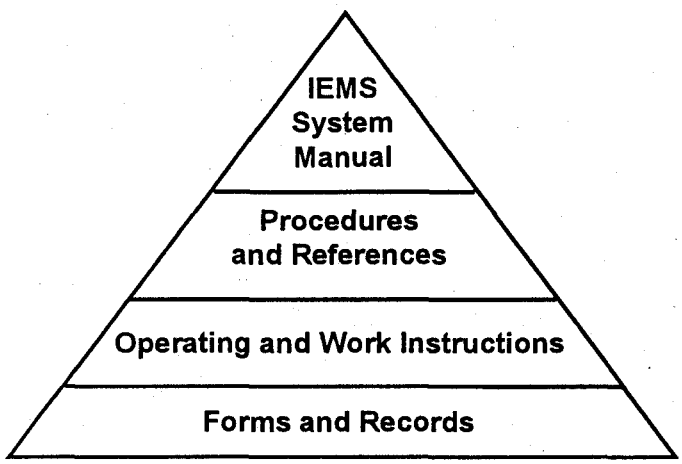
- What is the document's purpose?
- Who will use it, and how will they use it?
- How long should the document be?
- What must be included in the document? Which information is most critical?
- Is it process-focused? Process focus rather than regulation- or program-focus helps people who use the documents to better understand how their jobs fit into the rest of the company functions.
- How is the information best arranged? Will the user read sequentially or randomly?

Example: A Tiered Documentation System

The tiered documentation system consists of four "levels" of documents. The system can be shown as a pyramid with the environmental management system manual at the top and

records at the bottom (see Figure 8-a).

Figure 8-a. Documentation Levels



The pyramid shape illustrates a hierarchy in which the amount of detail, degree of specificity, and number of pages all increase as you progress from the top to the bottom of the figure.

Creating an Outline for the Process

It will be helpful at this point to develop some idea of what your IEMS documentation will look like, and thereby determine the work needed to fill it in. Doing so will help to plan the development of your IEMS. Create an outline for the process of developing your IEMS and your Company Manual or other form of documentation that suits your company. What and how much documentation you include depends upon your company's needs. The following outlines a sample Company Manual:

1. Environmental Policy
2. Environmental Action Responsibilities Assignments
3. Environmental Documents and Their Location
4. Identification of Environmental Aspects
5. Identification of Legal Requirements
6. Identification of Significant Environmental Aspects
7. Development of Objectives, Targets, and Action Plans
8. Conducting an Alternatives Evaluation
9. Development of Operational Controls
10. Environmental Training (Awareness and Task-Specific)
11. Emergency Preparedness
12. Review of New Products and Processes
13. Documentation and Document Control
14. Communication with External Stakeholders
15. Conducting a Compliance Assessment
16. Conducting an Internal Assessment
17. Taking Corrective Action
18. Management Review

The actual content of your outline will be filled in as you proceed to develop your IEMS.

Resource

Take a look at the accompanying *Company Manual Template* for sample procedures and formats to help you document important components of your IEMS.

Document Control

Documents must be easy to find and kept up to date. Consider the following points regarding your document control. Two worksheets follow this section. Worksheet 8-

2 will help you develop documents and Worksheet 8-3 will help you manage your documents once they have been created.

Sound document management ensures that:

- they can be located;
- they are periodically reviewed, revised as necessary, and approved for adequacy by authorized personnel;
- the current versions of relevant documents are available at all locations where operations essential to the effective functioning of the system are performed;
- obsolete documents are promptly removed from all points of issue and points of use, or are otherwise assured against unintended use; and
- any obsolete documents retained for legal and/or knowledge preservation purposes are suitably identified.

Worksheet 8-2: 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:					

Corresponds to CS–2 of the *Company Manual Template.*

Worksheet 8-3: Document Control

Document	Who Will Use It	Permanent Location	Periodic Review Schedule/ Who	When Can Be Destroyed
			/	
			/	
			/	
			/	
			/	

Contact Person: Date Completed:

Working with Stakeholders

Stakeholders are anyone who has a stake in your company's environmental performance. Stakeholders can play an important role in helping your company develop an IEMS. Employees have strong stakeholder interest in your company and can provide strong support for IEMS development. Customers, suppliers, and neighbors can provide useful input. In addition, establishing partnerships with trade associations, suppliers, professional associations, and community colleges can be very helpful in developing parts of your IEMS. This section addresses the kind of stakeholders you may wish to include in the process and the potential benefits of including stakeholders. While involvement of employees is critical to the success of your IEMS, how far you proceed with including additional stakeholders is your decision.



The DfE Program has found that including a variety of stakeholders in a project provides proven benefits. DfE stakeholders include: industry, government, labor, environmental groups, and others. Their inclusion ensures both a mix of viewpoints and a wealth of different experience and training that contribute to a project. This level and breadth of stakeholders may not be available to a small company, but opening your IEMS planning process to a variety of stakeholders will improve results.

Stakeholder Roles

Consider why you would want to include internal and external stakeholders and what roles they can play. Before engaging stakeholders, be clear on what you expect their role to be. What do you want from them? What do you intend to tell them? Consider the following:

- Internal stakeholder (e.g., employee) participation can facilitate implementation of environmental projects as employees "take ownership" of the IEMS process and the process changes it may bring;

- Different stakeholders bring useful perspectives to identifying environmental issues, often identifying issues that might otherwise have been overlooked;
- Participation by all types of stakeholders can add credibility, transparency and value to your IEMS;
- Involving external stakeholders can help them understand your business operating constraints;
- Sometimes being an environmental leader can gain customer recognition and loyalty, and involving customers in your IEMS helps them recognize your leadership.
- Forming partnerships with customers and suppliers can help to identify shared concerns and ways to cooperate to resolve them. There may be ways that your company can help your customers meet their environmental management needs. Forming partnerships with suppliers can help your company obtain important information and may help you meet your IEMS goals.

☞ **Tip**

Working together with your customers to identify common needs in managing environmental concerns can help to build long term relationships.

Identifying Stakeholders

Almost every organization will have a wide array of internal and external groups that may be interested in and helpful partners to that organization. These groups will not be homogenous. Each will have its own priorities and perspectives, and each will have something different to contribute in support of your IEMS.

The following list provides types of stakeholders:

Internal Stakeholders

- Employees
- Shareholders
- Customers
- Suppliers
- Investors & Insurers
- Trading Partners

External Stakeholders

- Neighbors
- Community
- Organizations
- Environmental Groups
- Larger Companies
- The Media
- The Public
- Local Government

You may want to start with those stakeholders who have expressed interest in your operations. If you wish additional input, you can contact the following sources in your effort to locate suitable stakeholders:

- ask your organization's own employees, including plant/site managers and public relations personnel;
- contact local officials for suggestions;
- contact a local planning agency for suggestions;
- contact local schools, community colleges, or

☞ Tip

Remember, your stakeholders' concerns may be very different from what you expect, and even less difficult to resolve than you may think. The only way to find out is to talk with them.

universities; or

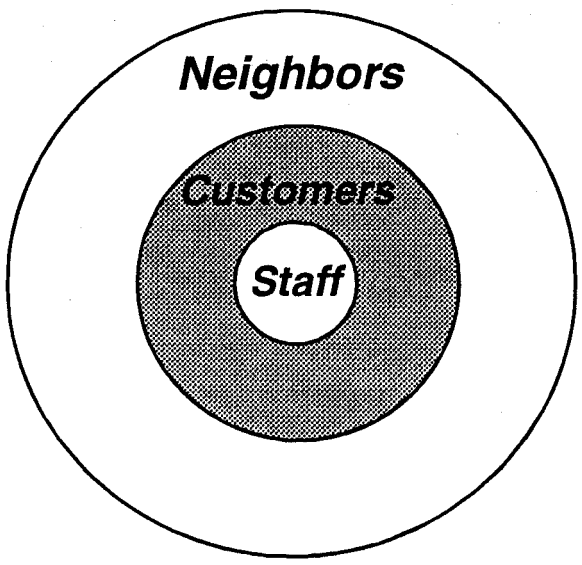
- contact a national advocacy group to elicit suggestions as to which local or national groups may be interested/suitable.

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.

Develop stakeholder participation in stages and learn as you go. You might think about the different kinds of stakeholders as forming ever broader circles around your business (see Figure 8-b). Begin with the innermost circle and work outward.

Figure 8-b. Levels of stakeholder interest



Communications

When working with either internal or external stakeholders, including your IEMS team, effective communication will facilitate a smooth implementation of your IEMS. 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 IEMS that will work. In small and large organizations alike, early communication will pay off in greater acceptance of the resulting system.

☞ Tip

It's important to revisit the communication plan at various stages of your IEMS development to add any additional communication needs for each piece of your IEMS.

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 IEMS communication policy for your company. The policy 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. In addition, the policy should discuss how the company will report environmental health and safety (EH&S) incidents, such as spills, accidents and "near misses". The policy should include who reports what, to whom, and when.

☞ Tip

Create and maintain a list of everyone you can think of who would be interested in your company's environmental activities. Include how you could reach them. You can then make a decision about where to begin. You could start with staff and later add other audiences if that suits your capabilities and needs. It is helpful to make your communication list as complete as possible to start with but pare it down to start out. Begin small, and then you can use the list to expand when ready.

Communicate regularly and integrate IEMS communication.

To build support for the IEMS, 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 intervals may be the best mechanism for ensuring good communication. Use existing channels of communication to get the message out on your IEMS 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;
- company website;
- scheduling tours of your facility;
- producing a fact sheet about your company's activities, the EMS program, and why and how your company would like to include stakeholders;
- establishing a phone line to answer questions, record concerns, etc.;
- going to local schools, community colleges, universities,

or civic organizations, such as the Rotary, that may provide a focal point of interest about your company; and

- holding public meetings when you feel it is appropriate.

Ensure that stakeholder dialogue is a two-way process. The stakeholders will want to know that their comments and concerns are being listened to and taken into account. You need to convey that your organization is genuinely and actively including them.

Worksheet 8-4 will help you develop criteria.

Worksheet 8-4:* Working with Stakeholders

Your Stakeholders	Potential Environmental Interest	What you want to tell them:	What you want them to tell you:	How to communicate with/tell them:	When	Person Responsible
(Example) Employees		Environmental policy	How to get it done	Memo, bulletin board, meetings, suggestion box, intranet		
(Example) Neighbors		Environmental policy and IEMS plans	Their environmental concerns	Meetings, open house, flyers, suggestion box, web site		
Customers		Environmental policy and IEMS plans	Their environmental concerns	Above, plus inserts in direct mail advertising, or billing, web site		
Contact Person:			Date Completed:			

*Report results on CS-01 in *Company Manual Template.*

To complete this worksheet, think about ways to use your current means of communication to begin your dialogue. Consider which methods will work to convey your message to each group, and which will work to obtain the information you want to get from each group. The means that you choose may be different for each stakeholder group.

In addition to communicating with your stakeholders, it is important to track their communication 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. Worksheet 8-5 will assist you in setting up and documenting each communication.

The following Case Study shows how "Company B" set up a process to train and then use its internal stakeholders to identify environmental concerns and some of the benefits achieved.

☞ **Tip**

Make use of current technology. A company website can be used to communicate your company's environmental policy and other important elements of your IEMS. It can also be used to solicit comments and suggestions from stakeholders.

Worksheet 8-5: Stakeholder Communication Record	
Date Communication Received:	
Type of Communication:	
Received From:	
Address/Telephone Number/E-Mail:	
Content of Communication (attach copy if possible):	
Will ABC Company Respond?	Y N
Date of Response:	
Person Responding:	
Nature of Response (attach copy if possible):	
Are Internal Actions Necessary? (If Yes, fill out a Corrective Action Form.)	Y N
Contact Person:	Date Completed:

Corresponds to CS-02 of the *Company Manual Template*.

Case Study: Company B — Working With Stakeholders

Company B is a 30-person company that manufactures sangria and chile salsa. With strong senior management backing and support from a local consultant, Company B focused initially on building environmental consciousness among its employees. To all of its workers and managers the company offered general environmental awareness training as well as more specific training on how to identify specific environmental issues. Employees then split into 10 teams, each charged with identifying the environmental issues associated with a specific area of operation, from the acquisition of raw materials through to product delivery. Based on the work of these teams, Company B developed a list of its most important environmental issues and concrete objectives and plans for improvement.

The key to Company B's success lay in using participatory teams to define new environmental problems and develop solutions. For example, the company identified waste of raw materials as an environmental issue, and teams from several areas found ways of reducing waste. Company B now requires its suppliers to use stronger containers to avoid materials spoilage. More significantly, the team from the mixing area realized that by using a spray nozzle to clean out left-over orange juice concentrate (a key ingredient in sangria) from large supply containers, it can recover an additional 3,000 pounds of concentrate (6% of its total consumption, valued at $4,200) per year. Company B gained an even greater economic benefit by revising its process for cleaning and sanitizing its stainless steel tanks, reducing use of an iodine-based cleaning fluid by 11,000 liters per year, or 90%, at an estimated yearly savings of $7,000.

Other benefits the company has realized include improved compliance, a safer work environment, and reduced emissions from its transport vehicles thanks to improved maintenance. The environmental awareness of all employees has increased significantly, with some workers extending their new-found environmental consciousness to their homes. The company has also publicized its participation in the EMS project to the local community in an effort to improve its community relations and to help improve the environmental awareness of the community.

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3.4 Training, Awareness and Competence [ISO 4.4.2]

What the ISO Standard Requires

The ISO 14001 Standard requires the facility to provide appropriate training to all employees whose work could create a significant impact on the environment. Training is therefore required for key positions across the organization—not just the environmental representative. Training is required to make key people aware of the importance of conforming with the environmental policy, procedures, and with the EMS. They must also understand how their work could create significant impacts either actually or potentially, and their specific responsibilities as defined in environmental procedures and work instructions, including what could happen if they don't follow the procedures. A demonstration of competency is required, as evidenced by education, training, or experience.

Starting Points

Most facilities that have an environmental manager rely solely on the prior educational experience of that person. Other than legally mandated training for certain individuals, no training/skills assessment has been made across the facility. Therefore, companies are particularly vulnerable to problems that occur when a key person leaves. Typically, in small shops, no one may be ready to step in to carry the responsibility.

Implementation Tips

1) Most metal finishers started by listing the functional areas within their facilities that could create significant environmental impacts. A "training needs matrix" was used to identify the specific job classifications or specific individuals who required training. Include your existing environmental training needs, such as Hazardous Waste Operators and Waste Treatment Operators Training,

2) The minimum amount of training required is usually referred to as "awareness training," and includes a brief discussion of the EMS, and the specific tasks, procedures, and work instructions that are related to significant (actual or potential) environmental impacts.

3) Cross check the training needs you have identified with your environmental operation and control procedures. Be sure that you don't overlook periodic functions, such as start-up and shut-down, maintenance, laboratory, and contract workers.

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4) Remember that significant impacts covers your products and services as well as your operations and activities. You may need to provide some level of training for engineering and design staff as well. Rack design and maintenance areas are examples of these types of functions.

5) EMS training does not need to be stand-alone training. Look for opportunities to combine training with existing environmental, health, and safety programs. Formal training may be the most direct way to ensure employee awareness but it is not the only option. For example, employees can read training information and sign off that they read and understood the contents. Whatever option you choose, it's a good idea to have verifying signatures of all those who received training.

Examples

1) Procedures for Identification of Training Needs

The best procedures included a fairly detailed description of the process to be used for identification and review of environmental training needs. The procedures covered, for example:

- ❑ Basis for review
- ❑ Frequency of review (e.g. a minimum of once per year)
- ❑ What to consider (future requirements, technological advancements, environmental requirements, changes in company directives, cross-functional and specialized needs, new or revised policy and procedures)
- ❑ Development of a training program
- ❑ Mechanisms and responsibility for performing training
- ❑ Evaluation of training and record keeping (e.g. EH&S Director maintains a training file for each production employee)

2) General Awareness Training

The Standard requires employees at each relevant function and level to be made aware of certain aspects of the EMS. Some aspects (for example, the importance of conformance with the environmental policy and procedures) will be broadly applicable to most, if not all, of the employees at a facility. One company included a section on Awareness Training in their EMS Training procedure:

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The Environmental Committee is responsible for making individuals and departments aware of:

- ❑ The importance of conformance with the environmental policy and procedures, and with the requirements of the EMS
- ❑ The significant environmental impacts (actual or potential) of their work activities and the benefits of improved performance
- ❑ Roles and responsibilities for achieving conformance with the requirements of the EMS, including emergency preparedness and response
- ❑ The potential consequences of departing from specified operational procedures

Conformance Check

The ISO 14001 Standard requires that "all personnel whose work may create a significant impact upon the environment" receive appropriate training. One metal finisher noted in their training, awareness, and competence procedures, that training needs would be identified by a review of:

- personnel
- process equipment
- the uniqueness of the process to be performed

The criteria for determining training needs did not include employees whose work may be linked to a significant environmental impact. While this omission is not in itself a nonconformance with the ISO 14001 Standard, it may lead to an important omission in determining training needs.

Note that you must actually train your employees. Simply referring to posted information or minutes from meetings would not provide effective training. An EMS auditor (internal or external) would verify implementation of a training program through interviews with employees throughout the facility. Employees may be asked questions such as:

- In your own words, what is your company's environmental policy? What does the policy mean to you and your job?
- How does your job interact with the environment? What procedures describe what you do? What might happen to the environment if you did not follow procedures?

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- What would you do if there were a spill in your area?
- What types of environmental training have you received?

In addition, an EMS auditor may request verification that training was provided (such as sign-in sheets) and ask how you determined the competence of individuals whose jobs may cause significant environmental impacts. (Note: The standard gives your company wide latitude in determining the basis for the competency of personnel).

EMS Links

- Policy: The connection between policy and training is direct. The ISO 14001 Standard requires communication of the environmental policy to all employees, but just sending them a copy of the policy is not enough. The standard also requires that employees are aware of the importance of conforming to the policy. This awareness is a key part of many company's general environmental awareness training.
- Environmental aspect: Aspects are linked to training through the references under the training, awareness, and competence section to environmental impacts (e.g., "It shall require that all personnel whose work may create a significant impact...," "The significant environmental impacts of their work..," "tasks which can cause significant environmental impact.."). It is important to remember to review your training program when new significant aspects (and therefore, significant impacts) are identified to be sure all appropriate personnel are receiving the necessary training.
- Structure and responsibility: Employees should be aware of their roles and responsibilities in conforming with the environmental policy, company procedures, and any other requirements the company has made part of their EMS.
- Operational control and Monitoring and measurement: Employees must be aware of the procedures that govern their work including any monitoring or measurement that is part of their job.
- Emergency preparedness and response: The standard specifically calls for employees to be trained on or aware of the facility's emergency preparedness and response requirements.

ELEMENT 3.3

TRAINING

Training is an important aspect of any EMS because it can be used to build awareness and competency on (1) the EMS and (2) specific tasks related to meeting EMS objectives and targets. Training at C/Us is often further complicated by the complex and diffuse nature of their organizational structure, and the number of different departments in which EMS Participants work.

The goal of a C/U's EMS training should be three-fold:

1. EMS Awareness – provide understanding of what the C/U's EMS is and how it works
2. Task-Specific Training – to provide task-specific training on topics to those EMS Participants able to aid progress toward the EMS objectives and targets
3. Training Required by Regulations – to comply with applicable environmental and health and safety training requirements

Training Hints:

- Incorporate EMS Awareness Training into existing training received by EMS Participants and consider making the training a regularly scheduled update.
- Consider on-line training as a way to accommodate varying schedules and far-flung audiences
- Consider videotaping training sessions for use later as refreshers or with new employees.
- Factor training needs and abilities into hiring practices.

Potential Training Resources:

- EMS Team Members
- Outside Consultants
- Departmental Professors
- Graduate Students
- Suppliers/Vendors
- Local, State and Federal Regulatory Agencies
- Self-Directed Study
- Computer-Based Training

In tackling EMS Awareness training, develop an agenda and materials for EMS information you want every EMS Participant to understand and then add training modules to accommodate the specific needs of particular audiences. For example, the EMS Team likely wants each EMS Participant to understand the C/U's:

- Environmental policy;
- Significant environmental aspects and impacts;
- EMS roles and responsibilities; and
- Initiatives for meeting EMS objectives and targets.

In addition, the EMS Team may want to develop specific EMS awareness training modules such as:

- "EMS Costs and Benefits" for C/U administration
- "EMS Administration Review" for the EMS Administration Review Team

- Environmental Policy for new student orientation

Implementation: Use the following steps, *Procedure 3.3, Training*, and the two tools provided in this element (EMS Training Matrix and Individual EMS Training Plan) to build a list of training needs for each EMS Participant.

1. Identify Training Needs – Catalogue training needs for each employee in each of the three categories listed above and fill in the EMS Training Matrix starting with EMS Awareness Training topics listed above, adding task-specific training relating to specific objectives and targets, and finally adding Training Required by Regulations (often apparent after performing a compliance review as part of *Element 2.2, Compliance*). This training matrix will help you determine "big picture" training needs and develop individual training plans according to one's position. This tool might also be useful for managers when estimating training expenses and planning for new employee training and orientation. An example of a completed EMS Training Matrix is provided.

2. Build Individual EMS Training Plans – Complete training plans for individuals or categories of people (i.e., landscaping staff or laboratory managers) using the tool provided. An example of an Individual EMS Training Plan is provided.

3. Conduct Needed Training – Building upon existing C/U training programs, identify training resources and conduct training.

4. Maintain Training Records – Use the Individual EMS Training Plan to record the dates training is planned and the dates training has occurred.

5. Evaluate Training Effectiveness – Review the impact of training on EMS effectiveness through interviews of EMS Participants and considering the results of EMS Audits and Management Reviews.

SAMPLE PROCEDURE ONLY – REVISE AS NEEDED

[C/U Name]	EMS Procedure	3.3
	Effective Date	
	Subject	Training

Purpose This procedure is used to develop and implement a training program for EMS Participants that (1) achieves EMS awareness, (2) provides task-specific training related to EMS objectives and targets, and (3) provides training required by regulations.

Step 1 The EMS Manager will identify training needs for each employee by completing the EMS Training Matrix and identifying training needs in any of three categories: EMS Awareness Training, Task-Specific Training relating to specific objectives and targets, and Training Required by Regulations.

Step 2 The EMS Manager and others will review past training and the nature of the employee's work and develop individual training plans for EMS Participants. Individual training plans will be developed, reviewed, and revised when the following events occur: a new hire is made, an EMS Participant's role or responsibility changes, a new material, process, equipment, or regulation is introduced to a department or functional area.

Step 3 The EMS Manager will arrange for and/or conduct needed training according to the schedule identified in the individual training plans.

Step 4 The EMS Manager will document dates, attendees and subject for past and planned training in the individual training plans. Training documentation will be retained at the facility for at least 2 years.

Step 5 Training effectiveness will be evaluated annually as part of the management review to ensure that EMS training is contributing to the EMS being implemented effectively; appropriate changes to the training program will be made based on the findings.

Responsible Person: _____

Signature and Date: _____

Employee Name/s: _____

Job Function(s): _____

Date: _____

*All training planned and completed by the EMS Participant should be recorded below; attach training agendas, materials, and sign-in sheets as appropriate.

Training Subject	Date Planned	Date Completed

_____

Responsible Person

[redacted]

Employee Name/s: Sara Usepa

Job Function(s): Grounds / Landscape Maintenance

Date: FY 2001-02

***All training planned and completed by the EMS Participant should be recorded below; attach training agendas, materials, and sign-in sheets as appropriate.**

Training Subject	Date Planned	Date Completed
40-Hour OSHA Training	*February 2001*	*February 2001*
Equipment Safety & O&M Refresher Course	*April 2001*	*May 2001*
Pesticide Management	*July 2001*	*July 2001*
EMS Awareness Training	*September 2001*	

Responsible Person

Effective Date

TRAINING MATRIX

nd Building Maintenance			Academic Departments				Campus Environmental Groups	
Field Supervisors	Field Staff	Student Staff	Department Head	Laboratory Supervisor	Laboratory Staff	Student Staff	Director/President	Members/Student

	Environmental Health and Safety			Facilit	
Responsibility	EH&S Director	EH&S Staff	Student Staff	Executive Manager/Director	Zone/Department Managers
EMS Awareness Training - University EMS Status Updated - Semi-Annual Policy Review & Development		X	X		
Supervisor EMS Training - EMS Awareness Training Development - Objective and Target Communication Training - Policy Implementation Training	X			X	
EMS Audit Training					3-4 Auditors should be Note: If possible, er
Hazardous Waste Management - 40 – Hour OSHA Training & Certification - University-Specific Policy Review		X	X		
Compliance Audit Training	X	X			
P2 Audit Training - Job-Specific P2 Audit Training - P2 Communication and Implementation Training	X	X			
Laboratory Procedure Training - Laboratory Policy Review - Laboratory P2 Training	X	X			

_____

Responsible Person

_____

Effective Date

CPW ENVIRONMENTAL MANAGEMENT SYSTEM PROCEDURE

The on-line version and secured hardcopy are the controlled documents. The secured hardcopy will be identified by an "Official Document" stamp giving date of distribution. Any and all other documents are uncontrolled. Contact the EMS Program Manager for revision level status.

Effective Date:	**October 1, 2000**	**Page 1 of 3**
Revision: 2	**Identification Number: EMS – 4. 4. 2**	
Title:	**Training, Awareness and Competence Procedure**	
Prepared By:	**EMS Procedures Subcommittee**	
Reviewed By:	**EMS Management Steering Committee**	
Approved By:	**William E. Koopman Jr., General Manager**	
	John Cook PE, Assistant General Manager	
Date Approved;	**August 25, 2000**	

0.0 Requirement: ISO 14001, Sub Clause 4.4.2 Training

1.0 Purpose

To identify, provide and track training that will help associates to minimize environmental impacts and increases operating efficiencies.

Scope

ISO 14001, sub clause 4.4.2, requires CPW to identify training needs and provide specific training to those associates whose work activities could cause adverse environmental impact.

3.0 Responsibility & Authority

3.1 Each department head shall identify environmental training needs.

3.2 The department head is responsible for maintaining environmental training requirements.

3.3 Environmental training needs will be evaluated annually by the department.

4.0 Procedure

4.1 Identification of Training Needs

The knowledge and skills of associates necessary for the department to achieve environmental objectives will need to be identified. Knowledge and skill levels should be considered in recruitment and personnel selection. Ongoing development of associate skills will occur through internal and external training and education programs.

4.2 Conduct of Environmental Training

Training appropriate to the achievement of environmental policies, objectives and targets will be provided to all personnel within the department. Associates should have an appropriate knowledge base, which includes training in the methods and skills required to perform their tasks in an efficient and competent fashion and knowledge of the impact their activities can have on the environment if performed incorrectly.

4.3 Legal and Other Requirements

Education and training will be performed in each department to ensure that associates have appropriate and current knowledge of regulatory requirements, environmental policy and the department's procedures and objectives. The level and detail of training will be determined according to the work assignment or task.

4.4 Training Elements

Departmental environmental training programs should have the following elements:

- Identification of associate training needs to accomplish job assignment;
- Development of a training plan to address defined needs;
- Training of target associate groups;
- Documentation of training received;
- Evaluation of training received.

NOTE: Examples of types of Environmental Training:

Environmental Policy All associates would be required to receive this training to gain an understanding and commitment to the environmental policy, objectives, and targets of CPW.

Strategic Environmental Management Senior management may receive this training to gain commitment and alignment of CPW's environmental policy.

Skills Enhancement Associates with environmental responsibilities linked to significant aspects shall be required to receive identified training to improve performance in specific areas of the department (e.g. operations, laboratory, engineering, maintenance, etc).

Regulatory Compliance Associates whose actions can affect environmental compliance shall be required to receive training on the appropriate regulatory and internal work instruction requirements and be made aware on the consequences of regulatory non-compliance or deviation from approved work instructions.

4.5 Adequate Resources

Adequate resources are to be made available to provide the identified training. In certain cases, training may require certified trainers, such as CDL, HAZWOPER or CPR. Environmental training will also be provided within six months of an associate's hire date. Annual refresher training will be conducted on CPW policy, and departmental objectives and targets.

4.6 Tracking the Training Hours

To document compliance with regulatory and policy requirements, training hours will be collected and tracked. The department head will compare training received with the training plan to ensure policy goals are met. Training records should include:

- Associate name,
- Job title,
- Job description,
- Training requirements,
- Total training hours by category

5.0 Related Documents and Data

5.1 Environmental Training Records
5.2 Instructor Certification Records
5.3 CPW Training Record Form

Naval Aviation Depot, CH

ISO 14001 Procedure

Title	Document Effectivity	Status
Training, Awareness and Competence	First Issue Date 01/22/1999 Revision Date 04/27/1999	Issued
EMS Procedure No	**EMSMR**	Rev
EMSP442	Melito M Barrera/NI/NADEP	2

Purpose

To identify training needs for NADEP personnel whose work may create a significant impact upon the environment.

Scope

This procedure covers the roles internal to the NADEP organization associated with training, awareness and competence of the EMS.

Responsible Party	Responsibilities
EMS MR	• Coordinates EMS training requirements.
OUMR	• Assists in the coordination and delivery of Environmental Policy and SEA training, as necessary.
IPO	• Ensures that contractors and service providers whose assigned actions could contribute to environmental impacts targeted by the EMS objectives and targets receive training to the EMS.
EPO	• Assists, as necessary, in training contractors and service providers whose assigned actions could contribute to environmental impacts targeted by EMS objectives and targets.

PROCEDURE

1. **The EMS MR will:**

a. Coordinate Environmental Policy training for NADEP employees with the OUMRs.

b. Coordinate SEA training for applicable NADEP employees with the OUMRs and in other parts of the NADEP organization.

c. Successfully complete a 24-hour course on EMS Audits taught by an individual who successfully completed an ISO 14001 Lead Auditor course. A copy of the course certificate will be kept on file (see EMSP 453).

d. Coordinate new contractor and service provider training to the EMS with the EPO and the IPO. Training provided to contractors will be documented in the DCRS.

e Coordinate training for EMS internal auditors.

f. Coordinate management training for key management and others identified by key management.

g. Ensure that key management and others identified by the EMS MR, receive training in the use of the virtual EMS.

h. Designate individuals to conduct the various awareness trainings.

i. Ensure that identified training is documented (see EMSP 453).

2. The OUMRs will:

a. Ensure that personnel receive Environmental Policy training in coordination with the EMS MR.

b. Ensure that personnel whose actions can impact objectives and targets, receive training to the SEAs in coordination with the EMS MR.

3. Key Management (ESC, CO and OUM) will:

a. Receive a one-time, one hour management training specific to the EMS.

4. IPO will:

a. Implement procedures to ensure that new contractors and service providers are provided relevant environmental training in conjunction with the EPO.

5. The EPO will:

a. Identify required training needed to maintain compliance with relevant environmental legislative, regulatory, permit and other legal requirements (see EMSP 432).

b. Document all relevant compliance training delivered to NADEP personnel.

6. EMS Auditors will:

a. Receive a one-time, 24-hour training covering the ISO 14001 standard, details of the EMS, and auditing techniques. The training will be conducted by either a certified auditor trainer (certified by one of the ISO 14001 Accreditation Bodies), or an individual who successfully completed a 40-hour course conducted by an ISO 14001 certified auditor trainer. A copy of the course certificate will be kept on file (see EMSP 453).

References

ISO 14001:1996, Section 4.4.2

EMSP 432 Legal and Other Requirements

EMSP 453 Records Management

Document Edited By:
Form Rev 1.0.2 15 APR 2000

Environmental Management System
UNIVERSITY OF MISSOURI-ROLLA

Training Programs (And Proposed Training Programs) To Be Offered by Environmental Health & Safety

Environmental Management System (EMS) General Awareness Training

Recipients
All UMR Employees

Course Schedule

- Existing employees have received web-based training.
- New employees (faculty & staff) receive general awareness information during new employee orientation.
- Graduate assistants receive general awareness training each semester as part of the Campus Environmental Issues Training.

Course Content

I. Environmental Policy
II. Significant Environmental Aspects of UMR Activities
III. Importance in Following Environmental Procedures
IV. Consequences of Not Following Environmental Procedures
V. Emergency Preparedness
VI. Environmental Objectives & Targets

Campus Environmental Issues Training

Recipients

- Laboratory Managers: (New faculty and Graduate Assistants)
- Maintenance/Construction Technicians
- Maintenance/Construction Supervisors

Course Schedule
Offered once per semester

Course Content

I. EMS General Awareness Training

II. UMR Hazardous Materials Management Procedures
III. UMR Hazardous Waste Management Procedures
IV. Laboratory Safety Issues

General Environmental Health & Safety Training

Proposed new training program

Recipients

- Clerical Personnel- (Shipping/receiving or otherwise handling hazardous materials)
- Maintenance/Construction Technicians
- Custodial Workers

Bio-Hazardous Materials Training

Proposed new training program

Recipients

- Clerical Personnel (Shipping/Receiving or otherwise handling bio-hazardous materials)
- Laboratory Managers: (New faculty and Graduate Assistants)
- Student Health Services Personnel
- Intercollegiate Athletics & Intramural Personnel
- Custodial Workers
- Custodial Supervisors

Course Schedule
Undetermined

Course Content

I. Proper storage and handling of bio-hazardous materials
II. Proper disposal methods for bio-hazardous waste

Initial Radiation Safety Training

Recipients

- Staff Radiation Workers
- Faculty Radiation Workers
- Student Workers

Course Schedule
Course offered all year long on an as needed basis.

Course Content

I. General Awareness Information
II. Radioactive Materials/Handling Requirements
III. Emergency Procedures
IV. Prenatal Exposure R.G. 8.13
V. Radiation Signs, Symbols, etc.
VI. NRC Form 3-Notice to Employees
VII. Instructions for Users of Radioactive Materials
VIII. Hand-Held Instrument Requirements

Annual Radiation Safety Refresher Training

Recipients

- Staff Radiation Workers
- Faculty Radiation Workers
- Student Radiation Workers
- UMR Custodial Staff & Support Personnel

Course Schedule
Course offered once a year, or as requested

Course Content

I. Radioactive Materials/Handling Requirements
II. Emergency Procedures
III. Prenatal Exposure R.G. 8.13
IV. Radiation Signs, Symbols, etc.
V. NRC Form 3-Notice to Employees
VI. Individual Authorizations and Materials Authorized
VII. Hand-Held Instrument Training and Proficiency

Health Physics Training for Reactor Workers

Recipients

- UMR Reactor workers
- Custodial Staff assigned to the building

Course Schedule
Course offered once a year

Course Content

I. Radioactive Materials/Handling Requirements
II. Emergency Procedures
III. Prenatal Exposure R.G. 8.13
IV. Radiation Signs, Symbols, etc.
V. NRC Form 3-Notice to Employees
VI. UMR Nuclear Reactor Emergency Procedure

Asbestos Awareness Training

Recipients

- Maintenance/Construction Technicians
- Maintenance/Construction Supervisors
- Custodial Workers
- Custodial Supervisors

Course Schedule

- Existing UMR employees were trained in January 2001
- New employees are given the training during orientation, on an as-needed basis

Course Content

I. "Are You At Risk" video
II. "Controlling Exposures" video
III. Campus Contact Information
IV. References
V. UMR Asbestos Procedures

RECORDKEEPING

Records of training conducted by EHS are maintained in EHS office files.

Last Modified: *Tuesday, 19-Jun-2001 12:19:40 CDT*

The EMS Manager[2] shall chair the EMS Program Team, ensure the day-to-day maintenance of the EMS, and be accountable to the Director for the performance of the EMS.

The Director and the EMT shall be responsible for providing the resources essential to the implementation and control of the EMS.

A Management Review Team, comprised of the Director and members of the EMT, shall annually in November review the EMS for suitability, adequacy, and effectiveness.

5. Training, Awareness, and Competence

5.1. General Awareness Training

All DEQ employees shall receive general awareness EMS training. In the initiation of the EMS during 2001, Director of the Office of Pollution Prevention shall prepare a core general awareness training package and deliver this training, with the assistance of other EMS Program Team members, to all of DEQ's approximately 900 employees. The general awareness training subjects shall include the Environmental Policy, the potentially significant environmental impacts, the objectives and targets, and employees' roles and responsibilities in conforming with the requirements of the EMS.

Thereafter, the DEQ Training Manager shall ensure that EMS general awareness training shall be embedded in the overall DEQ training curriculum being developed by the DEQ Training Committee.

5.2. Significant Impact Training

Concurrent with its determination in February of each year as to which of DEQ's environmental aspects are potentially significant environmental impacts, the EMS Program Team shall identify the training needs of personnel whose work can cause a significant impact on the environment, determine the criteria for personnel competence, and recommend timeframes for delivery of training to the DEQ's Training Committee. These training needs shall become a part of the Environmental Objectives and Targets for the upcoming fiscal year.

The Training Committee shall determine the means and methods for delivery of this significant environmental impact training subject to DEQ's overall mission requirements.

5.3. Training Records

Records of training related to the EMS shall be established and maintained by the DEQ's Training Manager in accordance with Virginia's record retention policy for state agencies.

[2] The EMS Manager responsibility shall be carried out by the Director of Pollution Prevention & Compliance Assistance (Lead), Director of Enforcement Coordination, Director of Administration, and Director of General Services.

EMS Training Log (Sample)

Training Topic	Attendees*	Frequency	Course Length	Course Method	Comments	Date Completed
EMS Awareness						
Supervisor EHS Training						
Hazardous Waste Management						
Hazardous Waste Operations						
Spill Prevention & Response						
Chemical Management						
Emergency Response						
Accident Investigation						
Hazardous Materials Transport						
Hazard Communication						
Personal Protective Equipment						
Fire Safety						
Electrical Safety						
Hearing Conservation						
Confined Space Entry						
Lock-out/Tag-out						
Bloodborne Pathogens						
Job-Specific Training (list)						

Attendees Code
1: All Employees
2: Supervisors / Managers
3: Operators
4: Maintenance
5: Material Handlers
6: Engineering

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e-mail:
ems@kppc.org

Session 1

- Agenda
- KPPC "EMS / ISO 14001 Overview"
- Reading for Session 1:

  - EPA's "Aiming for Excellence" Report to promote the use of Environmental Management Systems
  - EPA's Draft EMS Action Plan
  - EPA Position Statement on EMSs (Federal Register, March 12, 1998)
  - Ford Requires Supplier ISO 14001 Certification
  - GM Requires Supplier ISO 14001 Certification
  - How and When to Develop ISO 14001 Series Environmental Management Systems
  - ISO 14001: A Discussion of Implications for Pollution Prevention
  - Kansas Air Lines: Do You Need an EMS? (.pdf format)
  - The Environmental Manager: Jury Out on EMSs as Reg Substitute

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Session 2

Agenda

Presentations: *

- KPPC "Planning for Success"
- **Mentor Presentations**
  - Bridgestone/Firestone Lavergne
  - Ford Motor Company
  - Hitachi Automotive Products
  - Toyota Motor Manufacturing of Kentucky, Inc
  - Toyota Motor Manufacturing of North America
  - Visteon Steering Systems

(* requires Microsoft PowerPoint)

Sample Environmental Policies

- Bundy Corporation
- Metokote Corporation
- P.H. Glatfelter
- Tier 2 Automotive Supplier
- Toyota Motor Manufacturing Kentucky, Inc.

Company A Sample Environmental Manual (Section 4.3.1-4.3.4)

Mentor Company Environmental Procedures:**

- Company B Environmental Aspects ID
- Company C Chemical Control Procedure
- Company C Environmental OSHA Control Procedure
- Company E Dealing with Environmental Impacts Procedure
- Company D Environmental Aspects Information
- Company E Handling of Regulatory Requirements Procedure
- Company D Environmental Management Program
- Company D Environmental Policy
- Company D Regulatory Tracking Procedure
- Company E Identification of Environmental Objectives and Targets
- ***Bridgestone/Firestone Lavergne***
  - Determination of Significant Environmental Aspects Procedure
  - Environmental Aspects List
  - Summary of Legal and Other Requirements
  - Identification of Legal and Other Requirements Procedure
  - Objectives and Targets for Significant Environmental Aspects
- ***Visteon Steering Systems***
  - Environmental Aspects Identification EP027Attachment
  - Identification of Aspects, Significance, Objectives & Targets Procedure EP027

- Relevant Legislative Permits and Other Requirements
- Objectives & Targets
- Objectives and Target Program Summary Regulated Waste EMP033
- Objectives and Targets Program Summary Mineral Spirits EMP026
- Objectives and Targets Program Summary Steam Boilers EMP035
- Master list of EMPs
- EMP Progress Summary Air Emissions Piston GrindersEMP014
- EMP Progress Summary CFC Program EMP036
- EMP Progress Summary EMP005
- EMP Progress Summary FESOP Permit EMP037
- EMP Progress summary Railroad Tracks EMP013
- EMP Progress Summary Training EMP034
- EMS Progress Summary Storm Ponds EMP010
- List of Environmental References

- *Toyota Motor Manufacturing Kentucky, INC.*
  - Identifying Environmental Aspects Procedure
  - Determining Significance of Environmental Aspects Procedure
  - Identification and Maintenance of Legal and Other Requirements Procedure
  - Establishing Objectives and Targets Procedure
  - Updating Objectives and Targets Procedure
  - Establishment of EMPs Procedure Example

(** requires Adobe Acrobat Reader)

Get Acrobat Reader

Reading for Session 2:

- Improving Environmental Performance with a Systems Approach
- The Attorney's Role in ISO 14001 Implementation
- PWB Case Study #7: Identifying Objectives for Environmental Management Systems
- PWB Case Study #8: Building an Environmental Management System
- Practical Pollution Prevention Reprints - Systems Approach Tools

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Session 2 Agenda

8:00-8:30	Welcome and introduction/manual overview (Mr. Cam Metcalf)
8:30-9:15	ISO 14001 on environmental policy, aspects, legal and other requirements, and objectives and targets (Tim Piero)
9:15-10:00	Industry presentation (Carol Maedel, Casco Products)
10:00-10:15	Break
10:15-11:00	Industry presentation (Sean McCarthy, Bridgestone/Firestone)
11:00-11:45	Techniques for determining aspects, impacts, and significance/exercise (Cam Metcalf, Kentucky Pollution Prevention Center)
11:45-1:00	Lunch (on own)
1:00-1:15	EMS Alliance webpage and email listserve overview
1:15-2:00	Industry presentation (Ben Kuo, Toyota Motor Manufacturing Kentucky, Inc.)
2:00-2:45	Legal and other requirements/exercise (Cam Metcalf, Kentucky Pollution Prevention Center)
2:45-3:15	Questions and answer/Wrap-up and adjourn

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Session 3

▶ Agenda

▶ Presentations: *

- KPPC "EMS Implementation and Operation"
- Mentor Presentations
  - Bridgestone/Firestone Lavergre
  - Ford Motor Company
  - Toyota Motor Manufacturing of Kentucky, Inc.

(*requires Microsoft PowerPoint)

▶ Company A Sample Environmental Manual (Sections 4.4.1 - 4.4.7) **and** Sample Environmental Procedures

▶ Mentor Company Environmental Procedures:**

- Company B Control of Documents
- Company C Structure and Responsibility Procedure
- Company C Communication Procedure
- Company C Document Control Procedure
- Company C Emergency Preparedness and Response Procedure
- Company E Structure and Responsibility
- Company E Training Awareness and Competence Procedure
- Company E Communication Procedure
- Company E Document Control Procedure
- Company E Emergency Preparedness and Response Procedure
- Company E EMS Documentation Procedure
- *Bridgestone/Firestone Lavergne*
  - Control Procedure
  - Plant Inspection Form
  - Pond Inspection Form
  - Sample EMP spreadsheet
  - Sample EMP Water Program ENV-016
- *Visteon Steering Systems*
  - Roles and Responsibilities
  - Structure and Responsibility Matrix
  - Training Needs
  - Training, Awareness and Competence
  - Responding to Community Complaints & Inquiries
  - Internal Environmental Communication
  - Community Complaint-Inquiry Report Form
  - Document Control Procedure
  - Spill Response Management Procedure

- *Toyota Motor Manufacturing Kentucky, Inc.*
  - Organizational Structure Example
  - Structure and Responsibility Procedure Example
  - Training Identification Matrix
  - Training, Awareness, and Competency Procedure Example
  - Identification of Training Needs Procedure Example
  - External Communication Procedure Example
  - Environmental Communication Form Example
  - Internal Communication Procedure Example
  - Document Control Procedure Example
  - Emergency Preparedness and Response Procedure Example

Reading Material for Session 3:

- Compliance-Focused Environmental Management System-Enforcement Agreement Guidance (EPA 330/9-97-002) This document presents key element for a compliance-focused EMS model and how they may be incorporated into a settlement agreement. This document is in Adobe Acrobat PDF format.
- EMR Survey Reveals Regulatory Violations in the Course of Several ISO 14001 Audits
- Ford Reaches ISO 14001 Milestone: All Plants Certified
- ISO 9001 and 14001: Specialty Manufacturer Develops Both Management Systems Concurrently
- The Saturn + 5 ISO 14000 Project
- Using Design for the Environment Concepts in Your EMS

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Session 4

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Agenda

Presentations *

- KPPC "EMS Checking and Corrective Action"
- **Mentor Presentations**
  Toyota Motor Manufacturing Kentucky, Inc.
  Bridgestone/Firestone Lavergne

(*requires Microsoft PowerPoint)

Class Exercises: Monitoring and Measurement Procedure

- Example One
- Example Two
- Example Three
- Example Four
- Example Five
- Example Six

Company A Environmental Manual (Section 4.5.1 - 4.6)

Mentor Company Environmental Procedures:**

- Company B Sample Contractor EMS Form
- Company B Sample Contractor Information Sheet
- Company C Monitoring and Measurement Procedure
- Company C Operational Control Procedure
- Company C Corrective Action Procedure
- Company E EMS Audit Procedure
- Company E Operational Control Procedure
- Company E Monitoring and Measurements Procedure
- Company E Records Procedure
- Company E Management Review Procedure
- *Visteon Steering Systems*
  - Monitoring and Measurement Procedure EP008
  - EMS Measurables EP008
  - Calibration Requirements EP008
  - Computer Systems Disaster Recovery ProcedureEP019
  - Corrective and Preventive Action Procedure EP026
  - Corrective and Preventive Action Request Form
  - Environmental Audit Summary Form
  - Internal Audit Form EP007Forms
  - Internal Audits and Non Conformance Follow-upEP007
  - Management Review of EMS Procedure EP028
  - Master List of Records
- *Toyota Motor Manufacturing Kentucky, Inc.*

- Operational Control Procedure example ea_000131_00
- Monitoring and Measurement Procedure example ea_000134_00
- Nonconformance, Checking and Corrective Action Procedure example ea_000126_00
- Records Procedure example ea_000137_00

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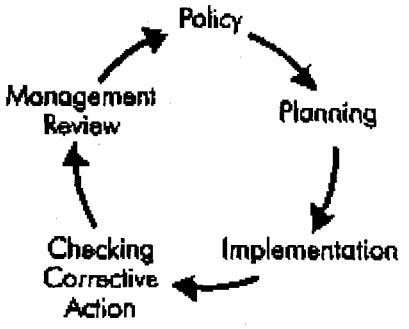
- Agenda
- Presentations *
  - Introduction to Auditing
  - Auditing Documentation
- Mentor Company Presentations *
  - Color & Composite Internal Auditing
  - Visteon Steering Systems Internal Auditing

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- EMS/ISO 14001 Auditing Tool Workbook

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Environmental Management Systems

EMS Development Course for Government Agencies - Introduction and Course Schedule



Welcome! My name is Julie Woosley and as coordinator of the EMS Development Course for Government Agencies, I hope this Web site will be a valuable resource to you as you work to implement an EMS at your facility over the coming year.

Below you will find a table charting the course by meeting date. Each date will link you to a page with that day's schedule and relevant documents, including speaker presentations, links to information about the day's topics, links to examples from real EMSs, directions to the course meeting place, and course handouts. You will want to print out these handouts before the course meeting date and bring them with you.

A **complete schedule** is available, and will be updated continually as the course continues, as will all the information on this Web page. It is intended to serve as your virtual textbook and main course information resource. You will want to check back regularly for changes in the schedule and documents. Feel free to print what you would like to keep, or save natural resources by using the documents online. Opinions about this Web site are appreciated; see page bottom for contact. A list of course participants and their contact information is also available.

Course Date	Course Subject	Course Location
July 23, 2001	**EMS and ISO 14001 Overview Training Class (optional)**	Parker Lincoln Building in Raleigh, 1:30 - 4:30 p.m.
July 24, 2001	**EMS Overview**	Parker Lincoln Building in Raleigh
Aug. 28, 2001	**Aspects and Impacts**	Parker Lincoln Building in Raleigh
	Aspects and Impacts -	Novozymes facility

Oct. 9, 2001	**Ranking**	in Franklinton
Nov. 13, 2001	**Objectives and Targets, the EMS Program and Implementation and Operation**	NC Zoological Park in Asheboro
Jan. 8, 2002	**Training, Awareness and Competence**	Charlotte
Feb. 12, 2002	**Operational Control and Monitoring and Measurement**	Cary
March 19, 2002	**Communication, Document Control, Records and Emergency Preparedness and Response**	Winston-Salem
April 16, 2002	**Internal Auditing and Checking and Corrective Action**	Shelby
April 17, 2002	**ISO 14001 Internal Auditor Training**	Shelby
May 14, 2002	**Management Review and Third Party Certification**	Toy Lounge, Dey Hall, UNC-Chapel Hill
June 25, 2002	**Graduation Ceremony**	EPA's new campus, RTP, 10:30 a.m. - 2:00 p.m.

All classes will meet from 9:30 a.m. to 4:00 p.m. unless otherwise noted.

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Site hosted by the NC Division of Pollution Prevention and Environmental Assistance.
1639 Mail Service Center - Raleigh NC 27699-1639
(919) 715-6500/(800) 763-0136 - fax (919) 715-6794
Pollution prevention or EMS question or comment? Send e-mail to: Julie Woosley
Site question or comment? Send e-mail to: Webmaster@p2pays.org

320 48 F PDF

Communications

4.4.3

Section I

"Communications" from NSF Guide

"Communication" from NSF Metal Finishers Guide

"Communication" from Colleges and Universities EMS Guide

Section II

Charleston Public Works Internal Communication Procedure

Naval Aviation Depot North Island Internal Communication Procedure

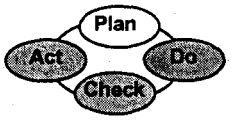
Naval Aviation Depot North Island External Communication Procedure

Virginia Department of Environmental Quality Communication Statement

City of Gastonia Wastewater Treatment Facility Call Routing Chart

Sample Brochure for a Company to publicize environmental info

Comments:



Communications

Maintaining the flow of information

Consider communication strategies for:

- ☑ neighbors
- ☑ community groups
- ☑ other interest groups
- ☑ local officials
- ☑ regulatory agencies
- ☑ emergency responders

The importance of employee involvement in developing and implementing your EMS has been discussed earlier. In addition, there may be parties with an interest in your environmental performance and management efforts outside the organization. Effective environmental management requires effective communications, both internally **and** externally.

Effective communications will help you:

- motivate your workforce;
- gain acceptance for your plans and efforts;
- explain your environmental policy and EMS and how they relate to the overall organizational vision;
- ensure understanding of roles and expectations;
- demonstrate management commitment;
- monitor and evaluate performance; and,
- identify potential system improvements.



***Pfizer Global Research & Development (formerly Warner-Lambert Parke-Davis)** has hosted local community leaders, state agencies, and federal agencies, to share its environmental activities and programs and to obtain feedback.*

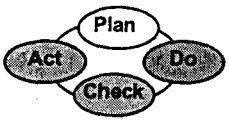
Effective **internal** communication requires mechanisms for information to flow top-down, bottom-up and across functional lines. Since employees are on the "front lines," they can be an excellent source of information, issues, concerns and ideas.

Proactive, two way communication with external parties is also important for an effective environmental management system. Taking steps to obtain the views of these stakeholders, which can include neighbors, customers, community groups, and regulators, will help you better understand how your organization is perceived by others. These stakeholders can also bring important environmental issues to your attention that should be addressed in your EMS. Your should also condiser ways to get specific advice from these stakeholders when developing critical elements of your EMS such as setting objectives and targets. Involving these parties, however, does not mean you should cede control of your EMS to them, but rather use their input to make your EMS stronger and more responsive to community concerns. Doing so will usually provide long-term benefits to your organization.

Thus, an effective EMS should include procedures for:

- communicating internally (between levels and functions within the organization), and
- soliciting, receiving, documenting and responding to external communications.

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Getting Started:

The first step in designing a communications program is determining **your key audiences.** Make a list of internal and external audiences.



***Milan Screw Products'** staff interviewed neighbors, customers, suppliers, and employees' family members to obtain the views of external parties.*

Once you have identified the audiences, determine **what** you need to communicate to them. (What do they need to know about your products, operations or management efforts? What are their concerns?)



A sample procedure for external communication is provided in the Tool Kit (see Appendix A)

Next, decide **how** you can best reach them. Appropriate communication methods might vary from audience to audience. Start by looking at your **existing methods** for communicating, both internally and externally. These might include:

Internal Methods	External Methods
• newsletters	• open houses
• intranet	• focus or advisory groups
• staff meetings	• web site or e-mail list
• employee meetings	• press releases
• bulletin boards	• annual reports
• brown bag lunches	• advertising
• training	• informal discussions



Hints:

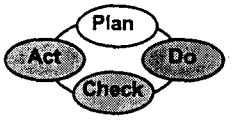
- Determine how **proactive** your external communications strategy should be. Select an approach that fits your organization's culture and strategy. Consider, for example, whether reporting on environmental performance and progress might give you a competitive edge.
- While a proactive external communications program may require some resources, many organizations find that a proactive communication strategy can be beneficial. Weigh the costs and benefits for yourself, but keep in mind that you might have many interested audiences.



- ***Environmental Policy***
- ***Environmental Aspects***
- ***Objectives & Targets***
- ***Structure & Responsibility***
- ***Monitoring & Measurement***
- ***Management Review***

- In communicating with employees, it is helpful to explain not only **what** they need to do but also **why** they need to do it. For example, when describing a requirement based on a regulation, explain the purpose behind the rule and why it is important. Also, make a clear connection between the requirement and how it applies to each person's job.
- Keep the message **simple,** clear, concise, and accurate.
- Managing responses to external inquiries does not have to be burdensome. Use a simple method, such as stapling an inquiry to its written response and then filing them together. The key is to be able to demonstrate that the organization has a process for gathering and responding to external inquiries.

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☆☆ ***POLLUTION PREVENTION*** ☆☆
and **Public Involvement**

Motorola has conducted Household Waste Electronics Recycling Days for local residents. Working in collaboration with local solid waste authorities, the Company has collected for recycle a variety of home electronic and entertainment equipment, small appliances and other products. At one of these events, over 21 tons of materials were collected and over 95% of these materials were recycled.

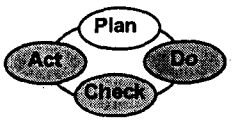
For EPA's Performance Track, organizations must commit to public outreach and performance reporting. Specifically, participating organizations must prepare an annual report on their EMS, a summary of progress on performance commitments, and of their public outreach activities.
See Appendix B for more information.



The community as part of the solution....

In an effort to involve stakeholders in the EMS process the Town of Londonderry, NH and the City of Lowell, MA engaged residents to collect information pertaining to environmental issues that affect their communities. For example, the Town of Londonderry, NH in conjunction with its household hazardous waste collection day, asked residents to complete a survey to prioritize community related environmental issues. The residents identified the fast pace at which the small community is growing as their top-priority issue. The City of Lowell, MA's wastewater treatment plant asked local residents to assist with efforts to address the plant's odor issues. A number of residents throughout the surrounding area recorded weather information on days the odor was prevalent. This information identified odor patterns which would aid the City's efforts to identify a solution to this problem.

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Capture the Learning: Communications Worksheet

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 ...	

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3.5 Communication [ISO 4.4.3]

What the ISO Standard Requires

The ISO 14001 Standard requires companies to develop procedure(s) for handling internal and external communication about their environmental aspects and their EMS. Internally, the communication procedure must address communication between the different levels and functions of the organization, and externally, the procedure must cover receiving, documenting, and responding to relevant communication from outside parties, such as neighbors, community groups, regulators, etc. The company must also consider providing additional communication to outside parties about its environmental aspects, and record the decision. The decision could be recorded, for example, in the minutes from a management meeting called to consider the question.

Starting Points

Environmental communication is a new concept for most of the smaller firms. They generally had no well established policy or procedure for handling requests for information, or recording or responding to complaints from neighbors, the community, or other outside groups. Often, calls are routed through an automated answering device, which makes it difficult to determine who could or should be the appropriate contact person. Generally, the companies had decided not to be proactive in communicating about their operations or their environmental aspects. Two of the companies had done some level of communication by inviting the spouses and families of workers in for an open-house.

Implementation Tips

1) List your current mechanisms for in-house communication. Generally, these include weekly safety/staff meetings, bulletin boards, inserts mailed in paychecks, company newsletters, etc. Whenever possible, use the existing channels of information to send information about environmental performance and the EMS to employees.

2) Set up a way of receiving information and suggestions from employees about environmental performance and concerns they might have. Obviously, this should be set up in such a way as to protect people from negative repercussions. Suggestion boxes and surveys are typical ways of getting employees involved.

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3) In-house communication on the EMS should not be limited to the individuals developing the EMS but must occur throughout the organization.

4) Most of the metal finishers included emergency communication and employee safety and health in the scope of their internal communication procedures. All procedures clearly defined what position was responsible for handling internal and external communications.

Examples

1) In some instances, the metal finishers went beyond standard requirements of both internal and external communication.

> The effectiveness of these (internal) communication processes is evaluated on an on-going basis, through employee surveys, environmental training program, organization audits and inspections, and informal discussions.

If you are going to include progressive statements in your procedures, assign a responsible party and a timeframe (as opposed to "an on-going basis) to the requirement. It is easy for an auditor, either internal or third-party registrar, to ask for documentation to verify whether or not you are meeting your own requirement.

Another example of going beyond standard requirements follows:

> External outreach is conducted when significant changes at the facility are being considered, such as facility expansion or other actions that might affect the actual or potential environmental impacts of the organization's products, activities, or services.

Exercise caution in going beyond ISO 14001 Standard requirements. The statement, "or other actions that might affect the actual or potential environmental impacts of the organization's products, activities, or services," is very broad and could require external outreach every time there is a process change.

2) For the important function of communicating with regulators, one participant designated a back-up in their external communication procedure.

> In the absence of the EH&S Director, communications with regulatory officials are delegated to the President.

3) One metal finisher helped to ensure a periodic evaluation of external communications efforts by tying it to their EMS management review. Their communication procedure called for a review and evaluation of proactive efforts to communicate with external parties as part of the management review process.

Conformance Check

The last sentence under 4.4.3 Communication element is one that often confuses organizations trying to implement an EMS. The ISO 14001 Standard requires only that an organization consider the process for external communication of its significant environmental aspects. This means what is says: you are not required to communicate anything regarding your environmental aspects to the public as part of EMS development but you do have to think about whether or not this communication is right for your facility. Participants were evenly divided on their approach to meeting this requirement: some included outreach to interested parties as part of their external communications procedure while others chose to respond only if asked by the public or required by regulations.

Whether or not a facility elects to communicate to interested parties on its significant environmental aspects, its decision must be recorded. This is a requirement that the metal finishers often overlooked, particularly if their decision was not to communicate to the public on significant aspects.

EMS Links

Remember that standard requirements for communication include both internal and external avenues and thus effect several other parts of your EMS.

- Policy: A facility's environmental policy is linked to both its internal and external EMS communications. Internally, the ISO 14001 Standard requires you to communicate your environmental policy all employees. The role of the environmental policy in your external communication is up to you. At a minimum, you must make it available to the public.

- Aspects; Objectives and Targets; Environmental Management Program(s): The most obvious linkage is with the standard requirement to consider a process for external communication of your environmental aspects (and therefore also possibly your objectives, targets, and environmental management program). However, internal

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communication should be continuing on progress made toward meeting and revising objectives and targets.

- Training; Awareness, and Competence: Training your employees on the EMS policy, procedures, and other standard requirements, is a primary part of your internal EMS communication.

- Management Review: As noted above, some metal finishers reviewed their progress in meeting external communication goals during the management review and based on this review, will make any needed changes to the communication goals.

ELEMENT 3.2

COMMUNICATION

Both internal and external communications about the EMS should be planned and implemented to ensure that environmental goals are met. Internal communication should explain the environmental policy and address the EMS roles and responsibilities delegated to employees as well as progress toward specific objectives and targets.

Two particularly unique audiences at colleges and universities for **internal communication** are faculty and students. Faculty should be part of the EMS effort and be solicited for input and advise where appropriate; specifically faculty is critical where their activities are sources of environmental aspects; for example, hazardous waste from laboratories or art studios. Faculty that works with chemical products containing hazardous constituents can be invaluable advisors regarding the environmental aspects and impact of the products used and the handling, storage, and disposal regulations that apply to waste material. Students, likewise, may have unique roles in the EMS. Some C/Us rely on students to gather information about operations and processes linked to EMS objectives and targets. Furthermore, all students should be aware of their ability to affect environmental aspects related to waste generation (especially solid waste and recycling) and resource use (especially energy and water use).

Effective communication can:

- Motivate your workforce;
- Gain acceptance for your plans and efforts;
- Explain your environmental policy and EMS and how they related to the overall organization vision;
- Ensure understanding of roles and expectations;
- Demonstrate management commitment;
- Monitor and evaluate performance; and,
- Identify potential system improvements

External communication is also an important element of the EMS. Communication with interested parties such as regulators, insurers, grant organizations, local community members, alumni, and emergency responders interested in the environmental impacts of the C/U should be addressed and documented. By maintaining meaningful dialogue and a proactive approach with external parties, a C/U can fulfill its environmental policy and realize EMS objectives.

Implementation:

Procedure 3.2a, Internal Communication and *Procedure 3.2b, External Communication* describe how and when to initiate and document internal and external communication respectively and can be implemented, in part, through the *Internal Communications* form and *External Communications* form. Both internal and external emergency communications can be implemented through the *Emergency Responses Communications* form.

Each of the forms include examples of common types of C/U communications, but each organization should tailor their communication plans to reflect existing methods that are effective and the unique characteristics of the audiences with which it interacts. Each of the three forms should be used as a planning tool to catalogue the types of communication and the intended audience; once identified, each type of communication can then be refined and assigned to responsible parties.

In addition, your C/U may find the concept of an "EMS Bulletin Board" a useful one to aid in communicating your EMS initiatives and progress to a wider audience. For C/Us, an EMS bulletin board can be implemented as a tangible paper and cork version located in the work area of the EMS Team, the Student Union, Faculty Lounge, or electronically through an intranet site, or both depending on the content and the intended audience. The "EMS Bulletin Board Checklist," helps provide (1) suggested audiences for your EMS bulletin board, (2) lists of documents you should consider putting on the EMS bulletin board, and (3) tips for developing and displaying your EMS bulletin board.

SAMPLE PROCEDURE ONLY – REVISE AS NEEDED

[C/U Name]	EMS Procedure	3.2a
	Effective Date	
	Subject	Internal Communication

Purpose This procedure is used to ensure adequate internal communication about the EMS.

Step 1 The EMS Manager will identify internal audiences, including faculty employees, students, staff, and possibly contractors of [C/U Name] who play a role in everyday operations.

Step 2 The EMS Manager will determine the type of information that needs to be communicated including general information regarding the EMS policy, individual EMS responsibilities, or specific waste reduction targets and measurements.

Step 3 Depending on the audience and information to be communicated, the EMS Manager will determine methods of internal communication. Initial forms of internal communication may include training, followed by meetings and postings in via email, intranet, websites, newsletters, or bulletin boards.

Step 4 The EMS Manager will determine the frequency of internal communication depending on the types of information being communicated.

Step 5 The EMS Manager and other appropriate [C/U Name] staff (identified in the internal communications form) will ensure that adequate internal communication occurs.

Step 6 Internal communications will be planned using the Internal Communications and the Emergency Response Communications forms. Records of all internal communication documentation will be retained for at least 2 years.

Responsible Person: _____

Signature and Date: _____

INTERNAL COMMUNICATIONS

Instruction: Use this form as a planning tool to catalogue the internal communications required for your EMS. For each internal communication topic determine the audience (to whom?) and necessary frequency (how often?). Document this plan by entering the audience and frequency for each form of communication.

Type of Information	Audience/Frequency					
	Training	Departmental Meeting	Individual Meeting	EMS Bulletin Board	Newsletter	Email/ Intranet/ Website
Example – Environmental Policy	• All Employees/ Annually • New Employees/ When Hired	Quarterly Sales Meeting		Posted in English & Spanish	Included on Back Page	On Separate Webpage
Environmental Policy						
Identifying Environmental Aspects						
Priority Environmental Aspects						
Compliance Awareness						
EMS Objectives and Targets						
Individual EMS Responsibilities						
Operational Changes						
Emergency Response and Preparedness						
Measurement and Monitoring						
Corrective and Preventive Action						
Results of Audits and Administration Review						
Annual Environmental Report						
Other						

_____

Responsible Person

_____

Effective Date

SAMPLE PROCEDURE ONLY – REVISE AS NEEDED

[C/U Name]	EMS Procedure	3.2b
	Effective Date	
	Subject	**External Communication**

Purpose This procedure is used to ensure adequate external communication.

Step 1 The EMS Manager will identify external audiences. External audiences may include suppliers such as neighbors, community groups, local officials, insurers, alumni, other C/Us, regulatory agencies, and emergency responders.

Step 2 The EMS Manager will determine the type of information that needs to be communicated. Information may include waste reduction successes, permit applications for new processes, or future plans to change processes or practices.

Step 3 Depending on the audience and information to be communicated, the EMS Manager will determine methods of external communication.

Step 4 The EMS Manager will determine the frequency of external communication depending on the types of information being communicated.

Step 5 The EMS Manager and other appropriate [C/U Name] staff (identified in the external communications form) will ensure that adequate external communication occurs.

Step 6 External communications will be planned using the External Communications and the Emergency Response Communications forms. Records of all external communication documentation will be retained for at least 2 years.

Responsible Person: _____

Signature and Date: _____

EXTERNAL COMMUNICATIONS

Instruction: Use this form as a planning tool to catalogue the external communications required for your EMS. For each external communication topic determine the audience (to whom?) and necessary frequency (how often?). Document this plan by entering the audience and frequency for each form of communication.

Type of Information	Audience/Frequency						
	Community Meeting	**Individual Meeting**	**Newsletter**	**Press Release**	**Annual Report**	**C/U Group**	**Email/ Website**
Example – Environmental Policy	**Open House Attendees/ Annual**	**Employees/ad-hoc**	**Alumni, Community /Quarterly**		**Stated in "Corporate Citizenry" Section**		**On Separate Webpage**
Environmental Policy							
EMS Objectives and Targets							
Waste Reduction Successes							
Health and Safety Successes							
Preventive Actions							
Results of Audits and Administration Review							
Changes Planned							
Permit Applications							
Annual Environmental Report							
Other							

_____

Responsible Person

EMERGENCY RESPONSE COMMUNICATIONS

Instruction: Use this form as a planning tool to catalogue the emergency response communications required for your EMS. For each communication topic identify the audience (to whom?) and necessary frequency (how often?). Document this plan by entering the audience and frequency for each form of communication.

Type of Emergency	Audience				
	Emergency Responders	**Employees**	**Community**	**Regulatory Agencies**	**Other**
Chemical Release/Spill	C/U Fire Department Local Fire Department Hospital National Response Center	Alarm Evacuation Notice	Neighbor Notification	POTW State Agencies EPA	
Worker Injury	911 C/U Fire Department Fire Department Ambulance Hospital			OSHA	Insurers
Natural Disaster	911 C/U Fire Department Fire Department Ambulance Hospital		Neighbor Notification		Insurers
Other					

Responsible Person

Effective Date

Many companies are best able to communicate their EMS to a broader group of employees by creating a "Bulletin Board EMS." You can do the same by selecting the key documents important to the day-to-day, week-to-week maintenance and tracking of the EMS and posting them for others in the C/U to see. By doing so, you can:

- ✓ Educate faculty, students, and staff on the purpose and direction of the EMS.
- ✓ Identify EMS objectives and targets.
- ✓ Engender wider "ownership" of the EMS objectives and targets.
- ✓ Show measurement and monitoring metrics in tables and charts
- ✓ Update and inform faculty, students, and staff of progress in reaching objectives and targets.
- ✓ Promote accomplishments and challenges faced by the company.
- ✓ Collect suggestions from faculty, students, and staff on ways to achieve objectives and targets.

The following is a list of documents that should be part of the "Bulletin Board EMS":

- ✓ Environmental Policy: signed by the C/U administrators and translated into appropriate languages (Element 1.1)
- ✓ "Summary of Objectives and Targets" form: lists each objective, target (numerical and deadline) on one page (tool from Element 2.3)
- ✓ "Actions Planned and Taken to Achieve Objectives and Targets" form: lists parameter and measurement frequency, actions taken, and responsible person for individual objectives and targets (tool from Element 2.3)
- ✓ Measurement and Monitoring Metrics: Tables and charts that track progress for each objective and target (Element 4.1)

✓ Roles and Responsibilities Organizational Chart: Chart showing names and responsibilities for EMS Team members and others as appropriate

Tips for Making Your Bulletin Board EMS Effective:

1. **Location, location, location:** Identify a commonly visited area where people will see the EMS and use enough space to avoid crowding of the documents.
2. **Arrange the documents in a logical manner:** Place the environmental policy at the top or left with subordinate documents below or to the right.
3. **Use colored paper to indicate items deserving special attention:** Use colors to indicate emphasis – green for progress or achievement, yellow for concern, and red for alarm. Use colored borders/arrows/paper to identify a special circumstance.
4. **Link O&T and M&M Metrics:** To emphasize the connection, place metric tables and charts adjacent to individual objective and target forms and use colored strips of paper to link them.
5. **Hold meetings in front of the Bulletin Board:** Conduct health and safety, and staff meetings at the bulletin board so that issues can be linked to the objectives and targets.

ELEMENT 3.3

TRAINING

Training is an important aspect of any EMS because it can be used to build awareness and competency on (1) the EMS and (2) specific tasks related to meeting EMS objectives and targets. Training at C/Us is often further complicated by the complex and diffuse nature of their organizational structure, and the number of different departments in which EMS Participants work.

The goal of a C/U's EMS training should be three-fold:

1. EMS Awareness – provide understanding of what the C/U's EMS is and how it works
2. Task-Specific Training – to provide task-specific training on topics to those EMS Participants able to aid progress toward the EMS objectives and targets
3. Training Required by Regulations – to comply with applicable environmental and health and safety training requirements

Training Hints:

- Incorporate EMS Awareness Training into existing training received by EMS Participants and consider making the training a regularly scheduled update.
- Consider on-line training as a way to accommodate varying schedules and far-flung audiences
- Consider videotaping training sessions for use later as refreshers or with new employees.
- Factor training needs and abilities into hiring practices.

Potential Training Resources:

- EMS Team Members
- Outside Consultants
- Departmental Professors
- Graduate Students
- Suppliers/Vendors
- Local, State and Federal Regulatory Agencies
- Self-Directed Study
- Computer-Based Training

In tackling EMS Awareness training, develop an agenda and materials for EMS information you want every EMS Participant to understand and then add training modules to accommodate the specific needs of particular audiences. For example, the EMS Team likely wants each EMS Participant to understand the C/U's:

- Environmental policy;
- Significant environmental aspects and impacts;
- EMS roles and responsibilities; and
- Initiatives for meeting EMS objectives and targets.

In addition, the EMS Team may want to develop specific EMS awareness training modules such as:

- "EMS Costs and Benefits" for C/U administration
- "EMS Administration Review" for the EMS Administration Review Team

CPW ENVIRONMENTAL MANAGEMENT SYSTEM PROCEDURE

The on-line version and secured hardcopy are the controlled documents. The secured hardcopy will be identified by an "Official Document" stamp giving date of distribution. Any and all other documents are uncontrolled. Contact the EMS Program Manager for revision level status.

Effective Date:	**October 1, 2000**	**Page 1 of 3**
Revision: 2	**Identification Number: EMS – 4. 4. 3 (A)**	
Title:	**Internal Communication Procedure**	
Prepared By:	**EMS Procedures Subcommittee**	
Reviewed By:	**EMS Management Steering Committee**	
Approved By:	**William E. Koopman Jr., General Manager**	
	John Cook PE, Assistant General Manager	
Date Approved:	**August 25, 2000**	

0.0 Requirement: ISO 14001, Sub Clause 4.4.3 Communication

1.0 Purpose

To build understanding, cooperation, and involvement from all associates in the performance of their duties in an environmentally conscious manner.

2.0 Scope

ISO 14001, sub clause 4.4.3, with regard to environmental objectives and targets, requires establishing processes to report internally and, where desired externally, on the environmental activities of the organization.

3.0 Responsibility & Authority

3.1 Communication of environmental issues is the responsibility of all CPW departments.

3.2 It is the responsibility of every associate to communicate environmental concerns, problems, or suggestions to their supervisor.

4.0 Procedure

4.1 Communication through Normal Management Channels

4.1.1 Management Channels
The traditional flow of information from one management level to the next is appropriate and will be used to communicate environmental information. Periodic, or routine staff meetings with open dialogue is encouraged.

4.1.2 Communication through Internal Newsletters
Certain environmental communications will be made through internal newsletters. Programs that promote environmental excellence should be communicated to CPW associates and considered for release to the public.

4.1.3 Communication through Videos
Videos may be used to relay environmental information to large groups of associates.

4.1.4 Communication through e-mail and Special Memos
Announcements concerning environmental improvement programs, upcoming internal audits, DHEC inspections, etc. will be disseminated through e-mail for large groups of associates or by special memo to specific individuals or groups.

4.1.5 Communication through Suggestion Boxes
Suggestion boxes will be made readily available to all associates. Communication in this form coming directly from individual associates is a valuable source of information about potential environmental impacts. Suggestions will be evaluated concerning environmental improvements. Rewards will be considered for suggestions that are implemented.

4.1.6 Special Communication via Attorney

Certain environmental information should be relayed only to those with a need to know by an attorney. When communication is done in this way the information is protected by the Attorney-Client privilege doctrine.

4.1.7 Recognition Communication
Both positive and negative recognition must be given to associates. Positive recognition shall be given in accordance with CPW recognition programs. Negative recognition must be given if employees knowingly violate regulations or CPW policies that adversely impact the environment. Disciplinary action will be administered in accordance with CPW policy.

4.2 Related Documents and Data

4.2.1 Records containing internal communication sent to associates.
4.2.2 Records containing associate feedback.

CPW ENVIRONMENTAL MANAGEMENT SYSTEM PROCEDURE

The on-line version and secured hardcopy are the controlled documents. The secured hardcopy will be identified by an "Official Document" stamp giving date of distribution. Any and all other documents are uncontrolled. Contact EMS Program Manager for revision level status.

Effective Date:	**October 1, 2000**	**Page 1 of 3**
Revision: 2	**Identification Number: EMS – 4. 4. 3 (B)**	
Title:	**External Communication Procedure**	
Prepared By:	**EMS Procedures Subcommittee**	
Reviewed By:	**EMS Management Steering Committee**	
Approved By:	**William E. Koopman Jr., General Manager**	
	John Cook PE, Assistant general Manager	
Date Approved:	**August 25, 2000**	

0.0 Requirement: ISO 14001, Sub Clause 4.4.3 Communication

1.0 Purpose

The purpose of this procedure is to define the steps that CPW follows to:

(1) Control the receipt, documentation and response to external communications regarding CPW's environmental aspects
(2) Consider external communication procedure on significant environmental aspects
(3) Document related decisions

2.0 Scope

ISO 14001, sub clause 4.4.3, with regard to external communication requires establishing processes on receiving, documenting and responding to communications from external interested parties.

3.0 Responsibility & Authority

3.1 The department head (or designee) investigates the need for external communication.

3.2 The Customer Relations Specialist prepares releases of public interest.

3.3 The General Manager (or designee) authorizes prepared releases to the public.

4.0 Procedure

4.1 External Communication Channels

4.1.1 With regard to CPW's environmental aspects or environmental management system (EMS) the department head (or designee) investigates the need for external communication on a case by case basis. The investigation can be initiated by, but is not limited to, the following:

- Complaints and/or inquires from customers, SCDHEC, community groups, or other interested parties
- External promotional activities regarding CPW environmental policy or programs
- New or changing environmental regulations

NOTE 1: Such communications include, but are not limited to:

- Statements regarding CPW's policy commitment to the environment
- Statements regarding CPW's significant environmental aspects and their potential impacts
- External interested party concerns and questions, and responses to these concerns and questions
- Reports on performance with regard to environmental quality, objectives and targets, and on compliance with environmental regulations as determined by audits and management reviews
- Communications initiated by or to be received by potential legal entities

4.1.2 The department head or (designee) identifies the extent and/or impact of the problem or inquiry and determines what information needs to be communicated.

4.1.3 The department head or (designee) obtains the needed information from the appropriate associates within CPW or the department and, as necessary assistance from the Customer Relations Specialist,

who constructs the content, format, and method of the communication accordingly. Designated individuals are then authorized to release information to external parties.

4.1.4 Statements regarding CPW environmental policy, significant environmental aspects and their potential impacts, reports on environmental performance or compliance with regulatory requirements and communications to legal entities, shall be reviewed and approved by the CPW General Manager (or designee) prior to release.

NOTE 2: Information in the communication should be understandable, adequately explained, verifiable, and presented in a consistent form. Methods to be considered include, but are not limited to:

- External newspapers or newsletters
- Public announcements and/or news conferences (TV, radio, etc.)
- Paid advertisements or public notices in newspapers, industry journals, or other publications
- Annual reports
- Regulatory submissions and public records
- Commission meetings
- Letters, memos and other correspondence
- Electronic mail messages; faxes, etc.
- Bill inserts
- Internet Web Site

4.1.5 Executive management (or designee) issues the communication to the required recipients and interested parties.

4.1.6 A copy of communication received or sent, as well as any requests that initiated the communication and/or requests for the information shall be retained for a period of **5** years.

4.2 Related Documents and Data

4.2.1 Records regarding EMS external communications.

ISO 14001 Procedure

Title	Document Effectivity	Status
Internal Communications	First Issue Date 01/22/1999 Revision Date	Issued
EMS Procedure No	**EMSMR**	Rev
EMSP443a	Melito M Barrera/NI/NADEP	0

Purpose

To establish procedures, roles, and responsibilities for internal communications associated with the EMS.

Scope

This procedure pertains to communication procedures involving the various levels and functions within NADEP.

Responsible Party	Responsibilities
EMS MR	• Establishes and manages internal communications related to the EMS.
OUMR	• Manages EMS communications internal to the OU. • Acts as the official point-of-contact for EMS communication between the OU and the EMS.

PROCEDURE

1. The EMS MR will:

a. Publish the Environmental Policy on the NADEP intranet and the NADEP internet web page.

b. Determine those internal communications to be documented in the DCRS on an Internal Communication form.

c. Ensure pertinent external communications (EMSP 443b) are documented in the DCRS (see EMSP 453) for the purposes of internal communication.

2. The OUMR will:

a. Receive beneficial suggestions and other forms of internal communications related to EAs and manage the review process to determine the appropriateness of entering them into the EMS (EMSP 431).

b. Relay internal communications by the EMS MR to the OU as well as from the OU to the EMS MR.

c. Ensure interested employees within the OU have access to the EMS.

References

ISO 14001:1996; Section 4.4.3 paragraph a

EMSP 431: Identification of Environmental Aspects

EMSP 443b: External Communications

Naval Aviation Depot, CA

ISO 14001 Procedure

Title	Document Effectivity	Status
External Communications	First Issue Date 01/22/1999 Revision Date 05/05/1999	Issued
EMS Procedure No	**EMSMR**	Rev
EMSP443b	Melito M Barrera/NI/NADEP	2

Purpose

To establish procedures, roles, and responsibilities for external communications associated with the EMS.

Scope

This procedure pertains to communications associated with the EMS among NADEP and its customers, business partners, and other interested parties. This procedure does not include communications (in any format) with environmental regulatory agencies regarding NADEP's environmental compliance.

Responsible Party	Responsibilities
EMS MR	• Documents external communications received by the command concerning the EMS. • Coordinates formal responses concerning the EMS for technical accuracy.
Public Affairs Office	• Reviews and approves formal responses concerning the EMS. • Acts as the command's point-of-contact for official external communications.

PROCEDURE

1. **The EMS MR will:**

a. Post the Environmental Policy on the NADEP Intranet and the NADEP Internet web page.

b. Ensure that external environmental communications pertaining to the EMS, including significant environmental aspects, received from the Public Affairs Office, NADEP management, or other NADEP personnel are documented in the DCRS when relevant.

c. The EMS MR will coordinate a response and submit it to the PAO for review and transmittal. The EMS MR and/or the PAO will record its decision.

2. **The Public Affairs Office will:**

a. Forward copies of clipping service articles concerning North Island environmental issues to the EMS MR.

b. Forward communications concerning environmental issues from

external interested parties to the EMS MR.

c. Ensure that NADEP employees who speak to the outside public on behalf of the NADEP Speakers Bureau, fill out an External Communication form. Any feedback concerning environmental issues will be forwarded to the EMS MR.

3. **Members of the ESC will:**

a. Record relevant environmentally related concerns and issues arising from conversations with customers, partners and other interested public, in the DCRS or any other internal communication tool, and forward this to the EMS MR, or;

b. Discuss and factor into the decision-making process the issues arising from the conversations above during management reviews.

References

ISO 14001:1996; Section 4.4.3 paragraph b

EMSP 453 Records Management System

External Communication form

Document Edited By:
Form Rev 1.0.2 15 APR 2000

6. Communication

6.1. Internal Communication

In line with its Environmental Policy commitment of "*encouraging open communication among all... DEQ employees*," DEQ will communicate to all levels and functions within DEQ relevant information about major areas of EMS activity, including:

- Environmental aspects and impacts
- Environmental objectives and targets
- Environmental management roles and responsibilities
- DEQ's performance compared to its environmental objectives and targets
- Environmental policies and procedures

The EMS Manager shall be responsible for ensuring that this procedure is carried out.

6.2. External Communication

In line with DEQ's Environmental Policy commitment to "*encourage environmental stewardship and foster improved environmental collaboration with stakeholders,*" DEQ will establish and maintain open communication channels for the exchange of mutually beneficial knowledge and information with all external, interested parties.

6.2.1. Receipt of External Communications

Any employee receiving a communication about the EMS or DEQ's environmental performance from an external party shall refer that communication to either the EMS Manager, the Director of Administration or appropriate Regional Director for a decision on response. The EMS Manager shall make all such responses on behalf of the DEQ and shall maintain records of all incoming environmental communications, including non-written communications, and of their disposition.[3]

6.2.2. Outreach

It is appropriate for DEQ to initiate community outreach efforts on its Environmental Policy and the EMS. Outreach efforts shall be the responsibility of the EMS Program Team which shall establish outreach objectives when establishing DEQ's other Environmental Objectives and Targets. Such outreach objectives shall be consistent with the Environmental Policy. The Management Review Team shall consider outreach efforts and results when conducting the Management Review of the EMS.

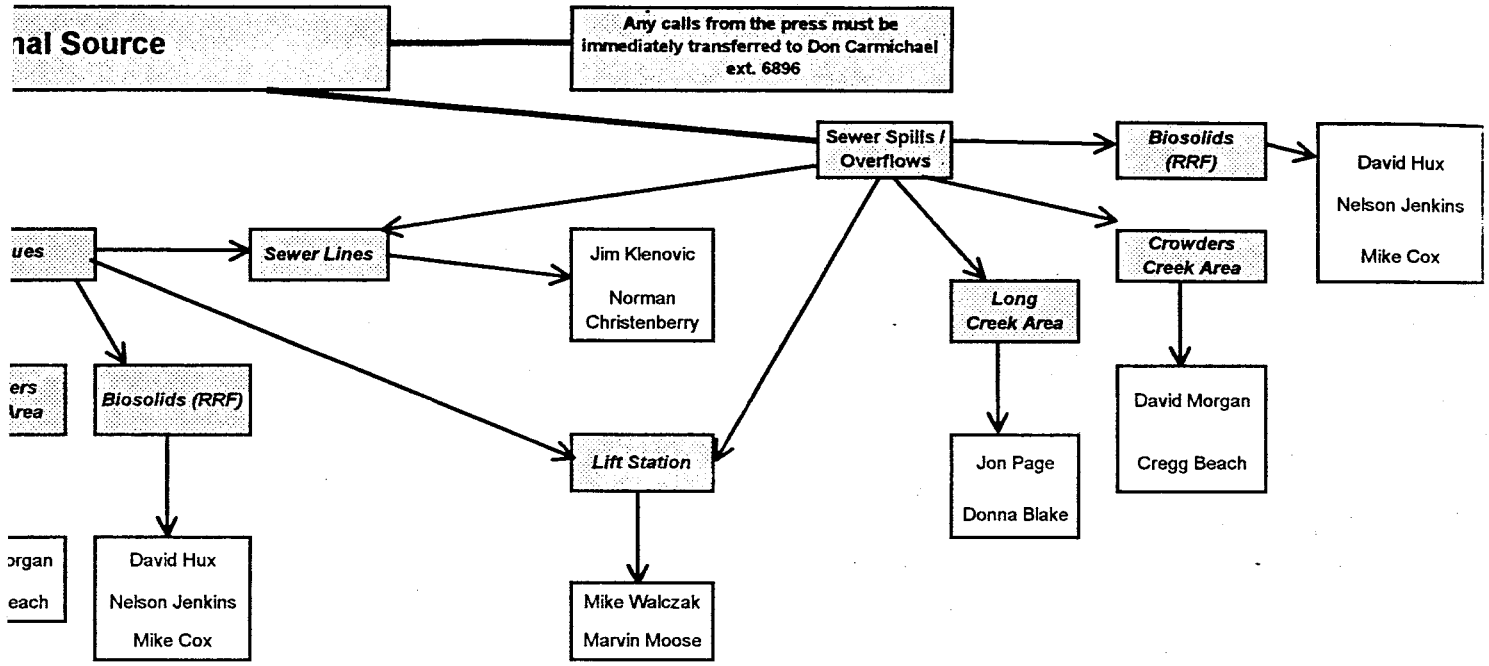
6.2.3. Website

DEQ will maintain information on its website about the Environmental Policy, the EMS, its environmental impacts, and its environmental objectives and targets. The EMS Manager, in collaboration with the Public Affairs Manager, shall be responsible for establishing and maintaining this information.

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[3] Responses on requests for information about the EMS and DEQ's environmental performance shall be made by the Public Affairs Manager.

VTD Call Routing Chart



Phone List

Jon Page - 922-4086
Donna Blake - 922-4086
Jim Eiden - 866-6726
David Hux - 854-6671
Nelson Jenkins - 854-6657
Nancy Matherly - 866-6058
Beth Eckert - 854-6669
Janet Maddox - 854-6672
David Morgan - 854-6657
Cregg Beach - 854-6657
Jim Klenovic - 866-6818
Norman Christenberry - 866-6927
Mike Walczak - 866-6829
Marvin Moose - 866-6985
Larry Cummings - 854-6670
Coleman Keeter - 866-6991

Prepared By: Beth Eckert, Industrial Chemist
Approved By: Larry Cummings, Assistant Superintendent of WWTD

Revised Date: 7/1/00 Effective Date: 2/1/00 Revision # 1
Associated Documents: EMS-0100.008;

City of Gastonia

Company Environmental Rules

* Report all environmental emergencies or potential incidents to the Safety/Environmental specialist, Department Manager or Supervisor.
* Do not dump any chemicals or processed water into the drains or sinks at any time.
* If using new chemicals, they must be approved by the Safety/Environmental Specialist prior to use.
* A MSDS sheet is required for all chemicals, paints, solvents or fluids used in this facility.

Environmental Objectives and Targets

	Objective	Target
*	Reduce Solid Waste by:	6%/yr
*	Increase Recycling by:	5%/yr
*	Reduce Hazardous Waste by:	5%/yr

* Help us recycle aluminum cans by placing your used cans in the aluminum can recycling containers located in the break room and on the outside patio.
* Increase recycling of cardboard and paper by placing your used cardboard and paper in a recycling container located near you. If you are unable to locate a container, just ask any employee where one is located.
* Performing both of the above tasks will not only increase recycling, but it will also decrease our solid waste.
* Reduction of hazardous waste is accomplished at the various machines. Environmental work instructions outline the proper procedure to follow.

All questions, concerns or comments should be directed to the Safety/Environmental Specialist at Ext. 101

All environmental questions from outside sources should be directed to the Safety/Environmental Specialist by completing the External Communications form

QUALITY

The Three Basics on Handling Abnormal Failures

1) **Stop** (Check the unusual condition)
2) **Inform** (Line Leader or Supervisor)
3) **Wait** for instructions

Abnormal Failure - A State Different From the Normal State

- Nonconforming to the work standard.
- Production of a defect which has never been experienced before.
- Production of consecutive defects.
- State of materials and/or equipment different from the normal state.

Work Instructions

Operator "Work Instructions" are posted at all work stations. The purpose of these instructions are to describe the work conducted at that station (e.g. setup, inspection, operating perimeters, environmental, etc.).

Please read and become familiar with these documents

February 16, 1999

Welcome to
Company XYZ
1101 Maple Drive
Louisville, KY 40202
502-566-1010

LOGO

Company Creed

In full awareness of our responsibilities as a manufacturer, we will devote ourselves to the progress and development of society and the well-being of people, thereby contributing to the growth of human civilization.

Quality Policy

We, at Company XYZ have as our quality policy a dedicated focus, by all employees, to provide to our customer's products which meet or exceed their expectations.

Our basic efforts are rooted in the areas of continuous product and process improvement to lower product cost and exceed our customer quality requirements, while providing dependable product delivery.

Environmental Policy

We, the employees of Company XYZ are committed to proactive environmental protection, prevention of pollution, and continual program improvement.

We will continually strive to meet or exceed local, state, and federal environmental regulations and other environmental programs to which the company subscribes.

We challenge ourselves to attain our environmental objectives and targets, which will be reviewed and revised on an annual basis.

SECURITY RULES

* Never give your badge or ID number to anyone.
* Report all vandalism to the Safety Representative or your Supervisor.
* Never let unknown personnel in the building at any time.
* Report all suspicious activities.
* Report any potential violence or threats of violence.

IMPORTANT PHONE NUMBERS

Plant Emergencies Safety/Environmental/Security	101
Human Resources	102
Engineering	103
Maintenance	104
Quality	105

SAFETY

HAZARDOUS COMMUNICATION HAZ-COM

* A written Haz-Com program is located in the Employee Health Office.
* Material Safety Data Sheets (MSDS) are located in the Employee Health Office and at each work section.
* Labels are required on all containers, **NO EXCEPTIONS.**

EMERGENCY EVACUATION PROCEDURE

On the sound of a fire alarm or by announcement, everyone will evacuate the building at the nearest available exit. Meet with your employee group in the employee parking lot or pre-designated areas.

FIRE:
Pull the fire alarm and exit the building

TORNADO

Tornado shelters are located in the rest rooms and locker rooms. Proceed to the shelter nearest your work area during a tornado "Warning." A weather radio is monitored for this purpose.

LOCK OUT TAG OUT

Lock Out Tag Out procedures are to be followed when performing maintenance on machines or other equipment that could cause injury by the unexpected release or start up of energy. The Supervisors and Line Leaders have the lock and key.

HOT WORK PROCEDURES

All cutting, brazing, and/or welding being performed out of the maintenance area must be approved. A hot work permit must be completed prior to the work being accomplished. To obtain a permit see Safety, Maintenance, or Engineering.

HEARING CONSERVATION

Every year audiometric tests are conducted on employees and maintained by the Safety Representative. Test results are located in the Employee Health Office.
Ear plugs are required in the following areas:

Blower Motor Sound Booth	Press Dept.
Compressor Room	Motor Test

ACCIDENTS

Report all accidents to your Supervisor or Safety Representative **immediately.** Failure to do so can result in corrective action. This facility has trained First Aid Personnel that can assist with injuries and/or make arrangements for further treatment.

FORK LIFT

No employee is allowed to operate a fork lift unless they have completed the fork lift operators course.

BOOM LIFT

No employee is allowed to operate the boom lift unless they have completed the boom lift operators course.

Documentation

4.4.4

Section I

"EMS Documentation" from NSF Guide

"EMS Documentation" from NSF Metal Finishers Guide

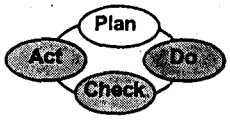
Section II

Naval Aviation Depot North Island EMS Documentation Procedure

Naval Aviation Depot North Island Other Plans and Documents Procedure

Virginia Department of Environmental Quality Documentation Statements

Comments:



EMS Documentation

Describing the EMS and how the pieces fit together

To ensure that your EMS is well understood and operating as designed, you must provide adequate information to the people doing the work. There also may be external parties that want to understand how your EMS is designed and implemented, such as customers, regulators, lending institutions, registrars and the public. For these reasons, the various processes that make up your EMS should be documented.

Rule of thumb:
Try to keep the EMS description document (or manual) to no more than one page per EMS element



Easy to read and understand
equals
easy to implement

The EMS Manual (or description document)

A "road map" or description that summarizes how the pieces of the EMS fit together can be a very useful tool. This roadmap generally takes the form of an EMS manual.

An EMS manual is a series of explanations of the processes your organization implements to conform to the EMS criteria (such as the elements discussed in the Guide). While you don't need to maintain a single "manual" that contains all of your EMS documentation, you should maintain a summary of the EMS that:

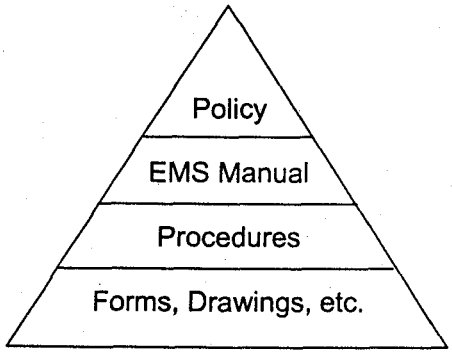
- describes the system's **core elements** (and how the elements relate to each other), and
- provides **direction** to related documentation.

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.

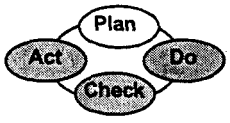
Figure 8:
Hierarchy of EMS Documentation



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. Document control and records management are discussed later in this Guide.

One way to think about your EMS documentation is to use the figure shown at left, which also can be applied to quality or other management system documents.

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You can maintain EMS documentation either on paper or electronically. There may be some advantages to maintaining documents electronically, such as ease of updating, controlling access, and ensuring that all readers are using the most up-to-date versions of documents.



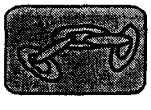
Hints:

- 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 flow charts or other graphics where they help explain the linkages from one system element to another

- 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 below illustrates what constitutes EMS documentation.



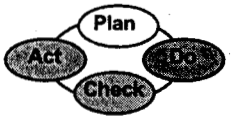
- ***Environmental Policy***
- ***Environmental Management Programs***
- ***Document Control***
- ***Operational Control***

- The usefulness of your EMS manual can be improved by including the organization's mission statement, 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. A sample outline for an EMS manual is provided in the **Tool Kit** (see Appendix A).
- 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 the manual frequently (see first hint, above).

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
- other EMS-related documents (such as emergency response plans, training plans, etc.)

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Capture the Learning: EMS Documentation Worksheet

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 ...	

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3.6 EMS Documentation [ISO 4.4.4]

What the ISO Standard Requires

ISO Section 4.4.4 (EMS Documentation) requires the facility to provide the "roadmap" to the overall EMS. It can be electronic or paper based, but it must provide a description of the components ("core elements") of the EMS and how they interact, and how to locate the related documentation.

Starting Points

None of the metal finishers had the specific "roadmap" to their procedures and documents as required by the ISO 14001 Standard. Typically, this element is completed near the end of the implementation process because it links it all together. However, the metal finishers who had familiarity with ISO or QS-9000 Quality Management Systems had a head start in understanding how to lay out the EMS.

Implementation Tips

1) Think of the EMS Documentation requirement as the overall roadmap to your entire system. Generally, the final version of the map isn't complete until the entire system is implemented, but you should start with a general framework in mind. This can start with the "Table of Contents" of your EMS Manual. Then you can add descriptions of how the various sections relate to the requirements of the ISO Standard, and to each other.

2) Several metal finishers developed an EMS Documentation procedure. This procedure included the overall description of the system, and defined responsibility for maintenance, review, and for making revisions as necessary. This approach missed the requirement to describe how the elements of the system function, and how they are related to each other.

Examples

It was difficult to specify good examples from those submitted by the metal finishers (see the discussion on the Conformance Check below). This situation will be resolved as the participants complete their EMS documentation.

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Conformance Check

The metal finishers in general had difficulty understanding how to implement the requirements of this section of the ISO 14001 Standard. Some metal finishers approached EMS documentation with an ISO 9000, document control mindset. This was reflected in the purpose statement of one EMS documentation procedure:

> Purpose: To establish the procedure to establish guidelines for the preparation, approval, revisions, distributions and control of the documentation for the EMS.

Confusion may stem from the title of Section 4.4.4 of the standard "Environmental management system documentation" which some metal finishers may have assumed was covered by document control procedures. However, the standard requirements under EMS documentation do not refer to the control of documents but to a description of the 17 elements of your EMS (e.g., policy, operational control, monitoring and measurement) and their interaction.

The same metal finisher described his facility's EMS manual in their document control procedure.

> The EMS Manual is organized according to elements of the ISO 14001 Standard. Each section of the manual shall contain procedures with some or all of the following subsections included: purpose; scope; definitions; responsibilities; procedures; references; associated material; revision history.

If the intent of this EMS manual is to meet the standard requirements under EMS documentation, it will likely fall short in three key areas: 1) describing the core elements of the management system, 2) describing the interaction of the 17 elements, and 3) providing direction to related documentation. The standard does not intend the EMS documentation to be a collection of procedures but a descriptive document.

Another metal finisher had the right intent in their purpose statement:

> This procedure defines the documentation associated with XYZ, Inc EMS, their interaction, and provides direction to related documentation.

However, the description that followed was of Tier I, II, and III documents (again, a document control approach), not of the elements of the EMS.

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EMS Links

Since the EMS documentation must describe the core elements EMS and their interaction, Section 4.4.4 pertains to all numbered requirements of ISO 14001.

ISO 14001 Procedure

Title	Document Effectivity	Status
Environmental Management System Documentation	First Issue Date 01/22/1999 Revision Date 08/11/1999	Issued
EMS Procedure No	**EMSMR**	Rev
EMSP444a	Melito M Barrera/NI/NADEP	1

Purpose

To establish a virtual EMS Manual that documents and describes the core elements and procedures of the EMS.

Scope

This procedure details the roles and responsibilities for ensuring that EMS documentation is developed and maintained in a virtual EMS Manual to address the specifications of the ISO 14001 EMS standard (current version) and its use at NADEP North Island.

Responsible Party	Responsibilities
EMS MR	• Manages a virtual EMS Manual (see EMSP 445). • Ensures that the EMS Manual accurately reflects the Environmental Policy and the NADEP organization.
ESC	• Establishes the resources for the development and maintenance of an EMS Manual which implements the Environmental Policy.
ITSM	• Provides hardware and software support as needed to ensure the integrity of the virtual EMS Manual.
OUMR	• Identifies improvements to the EMS and communicates these to the EMS MR.

PROCEDURE

1. The EMS MR will:

a. Develop and maintain a virtual EMS Manual. This includes preparing a summary sheet of recommended changes to the EMS Manual for presentation to the ESC.

b. Edit changes to the EMS Manual. Changes are documented in the DCRS via an Internal Communication form.

2. The OUMR will:

a. Communicate proposed changes of the EMS Manual to the EMS MR for continual improvement.

3. The ESC will:

a. Assign authority to the EMS MR to manage the virtual EMS

Manual (see EMSP 441).

b. Ensure that the EMS Manual is consistent with the organizational policies of top management.

c. Participate in the continual improvement of the EMS Manual as a part of Management Review (see EMSP 46).

4. General guidance:

a. Hard copies of the EMS Manual or parts thereof will reflect the date at the time of printing. The hard copy is considered an uncontrolled document the following day and will not be official. Only the electronic version of the EMS Manual will be considered current.

References

ISO 14001:1996; Section 4.4.4 paragraph a

EMSP 441 Structure and Responsibility

EMSP 443a Internal Communications

EMSP 445 Document Control

EMSP 453 Records Management System

EMSP 46 Management Review

Document Edited By:
Form Rev 1.0.2 15 APR 2000

Naval Aviation Depot,

ISO 14001 Procedure

Title	Document Effectivity	Status
Other Plans and Documents	First Issue Date 01/22/1999 Revision Date 09/10/1999	Issued
EMS Procedure No	**EMSMR**	Rev
EMSP444b	Melito M Barrera/NI/NADEP	1

Purpose

To provide direction to other plans and documents that are related to functions referred to by the EMS.

Scope

This procedure addressess environmental and safety compliance program plans and documents which are inferred to by the assignment of responsibilities in the EMS procedures.

Responsible Party	Responsibilities
EMS MR	• Maintains a current list of other plans and documents referred to by the EMS Manual (see General Guidance, below).
EPO	• Reviews and ensures that other plans and documents properly address environmental legal and other requirements.
OUMR	• Ensures that OU employees have access to other plans and documents as needed.

PROCEDURE

1. **The EMS MR will:**

a. Determine the applicable plans and other documents that are referred to by the EMS Manual and list them in this procedure.

b. Inform the EPO of potential changes needed to be made on applicable plans and documents and record this communication (see EMSP 453).

c. Ensure that requested modifications to other plans and documents have been made.

2. **The OUMR will:**

a. Ensure that plans and documents applicable to the performance of duties of employees in the OU are available for use (see EMSP 446a).

b. Alert the EMS MR whenever he/she determines potential deficiencies in applicable plans and documents and record this communication (see EMSP 453).

3. **The EPO will:**

a. Review and update the applicable plans and documents when requested by the EMS MR, or whenever changes to these plans and documents are made, and notify the EMS MR on the status of review (see EMSP 445).

4. The Statement of Environmental Policy:

a. Controlled hard-copy versions of the Statement of Environmental Policy shall be in color. Only one color hard copy of the current Statement of Environmental Policy shall be distributed to each organizational unit by the EMS MR. Previous color hard copy versions of the policy shall be turned into the EMS MR by the OUMR.

b. Copies of the Statement of Environmental Policy made for the purposes of training or other discussions, shall be made in black and white. Black and white copies shall be considered uncontrolled documents.

5. General Guidance:

a. Click on Other Plans and Documents for the official list of "other plans and documents".

References

ISO 14001:1996, 4.4.4, paragraph b

EMSP 445; Document Control

EMSP 453 Records Management System

EMSP 446a Operational Control

Other Plans and Documents

Document Edited By:
Form Rev 1.0.2 15 APR 2000

7. EMS Documentation and Document Control and Records

7.1. EMS Documentation

This EMS Manual describes the core elements of the EMS and provides direction to related materials. ISO 14001, in its various sections, requires that, at a minimum, the following policies, procedures, and delegations of authority be documented:

- The Environmental Policy
- The Environmental Objectives and Targets
- EMS Roles, Responsibilities, and Authorities
- Description of the Core Elements of the EMS
- Operational Procedures whose absence could result in deviations from the Environmental Policy or failure to achieve environmental objectives and targets
- Procedures to monitor and measure key characteristics of activities and operations than can have a significant impact on the environment
- Procedure for periodically evaluating compliance with environmental regulations
- Results of top management reviews of the EMS

This EMS Manual shall either contain these policies, procedures, and delegations of authority within its text or provide direction to users as to where they are contained.

Maintenance of the EMS Manual shall be the responsibility of the EMS Manager.

7.2. EMS Document Control

The EMS Manager shall maintain and control the *EMS Manual* and all other documents associated with it, such as the environmental objectives and targets, management plans to achieve them, and records of progress toward achievement. In maintaining and controlling the *EMS Manual*, the EMS Manager shall ensure that the *EMS Manual* and its associated documents are posted on the DEQNET and that updates adding new information and/or removing obsolete information are made immediately following any agreed changes to documents.

The EMS Manager shall preserve an original of all documents and changes, establish and maintain a record of all document changes, and ensure that all documents are numbered, dated with dates of origination or revision, and, where necessary, signed and approved.

7.3. EMS Records

§3 of this manual requires that the Manager of Legislative Affairs shall maintain an archive of relevant environmental laws, regulations, ordinances, and other requirements. §5.3 of this manual requires that the DEQ's Training Manager shall be responsible for maintaining records of training. §6.2.1 of this manual requires that the EMS Manager shall maintain a record of all incoming external environmental communications and of their disposition.

In addition to these recordkeeping requirements, the EMS Manager shall maintain records of findings and recommendations from EMS and regulatory compliance audits and documents,

Document Control

4.4.5

Section I

"Document Control" from NSF Guide

"Document Control & Records" from NSF Metal Finishers Guide

"EMS Document Control" from Colleges and Universities EMS Guide

Section II

Charleston Public Works Document Control Procedure

Naval Aviation Depot North Island Document Control

Sample Document Index

Comments:

CPW ENVIRONMENTAL MANAGEMENT SYSTEM PROCEDURE

The on-line version and secured hardcopy are the controlled documents. The secured hardcopy will be identified by an "Official Document" stamp giving date of distribution. Any and all other documents are uncontrolled. Contact the EMS Program Manager for revision level status.

Effective Date:	**October 1, 2000**	**Page 1 of 2**
Revision: 3	**Identification Number: EMS – 4.4.5**	
Title:	**Environmental Management System Document Control Procedure**	
Prepared By:	**EMS Procedures Subcommittee**	
Reviewed By:	**EMS Management Steering Committee**	
Approved By:	**William E. Koopman Jr., General Manager** **John Cook PE, Assistant General Manager**	
Date Approved;	**August 25, 2000**	

0.0 Requirement **ISO 14001; Sub Clause 4.4.5**
South Carolina Department of Archives and History. Division of Archives and Records Management

1.0 Purpose
This document describes the procedure to be followed for the approval, issue, and maintenance of all environmental management system (EMS) controlled documentation.

2.0 Scope
This procedure shall apply to all CPW EMS controlled documentation.

3.0 Responsibility & Authority

All EMS controlled documentation shall be subject to approval by the following before issue and release:

a) General Manager and Assistant General Manager for EMS Procedures affecting all CPW departments
b) Section Head and/or Department Head for site specific EMS documentation
c) EMS Program Manager for ISO 14000 EMS documentation

4.0 Procedure

4.1 EMS procedures, processes, work instructions, associated records shall be defined, appropriately documented and updated as necessary. Each department

will clearly define the various types of documents and records which establish the EMS.

4.2 A record (master list) of EMS controlled documentation affecting all CPW organizations shall be maintained within Information Services. EMS documentation (i.e., procedures or work instructions, records) which are specific to a department, shall be maintained and controlled within the department and include:

1) Reference number
2) Issue number
3) Disposition of copies

4.3 Distributed copies of EMS controlled documents shall be stamped "Official Document" with the date of distribution.

4.4 All EMS official documents will be of a standard format and contain the following:

- Effective date of distribution
- Number of document pages
- Revision number
- Title of document
- Preparer (originator) of document
- Approval authority (original on file if published electronically)
- Identification number

4.5 Distribution of EMS "official documents" may be published electronically with read only status. The original paper document with approval signature shall be retained on file.

4.6 All copies of EMS documentation that become obsolete by reissue shall be promptly removed, marked obsolete and handled in accordance with the "EMS Records Procedure."

5.0 Related Documents and Data

5.1 South Carolina Local Government Records Manual

5.2 EMS Records Procedure

Naval Aviation Depot, CA

ISO 14001 Procedure

Title	Document Effectivity	Status
Document Control	First Issue Date 01/22/1999 Revision Date 10/02/2000	Issued
EMS Procedure No	**EMSMR**	Rev
EMSP445	Melito M Barrera/NI/NADEP	3

Purpose

To control the generation, maintenance and distribution of documents required to implement the EMS at NADEP North Island.

Scope

This procedure applies to those documents which will either reside in the DCRS of the EMS, or are referred to in procedures contained in the EMS Manual.

Responsible Party	Responsibilities
EMS MR	• Ensures that documents required by the ISO 14001 Standard or identified in the EMS Manual (see EMSP 444b and EMSP 446a) are accessible, reviewed every EMS cycle or otherwise as required by the regulations, revised as necessary, and approved for adequacy.
ITSM	• Assists the EMS MR with system hardware or software issues to ensure proper document control and security on the electronic DCRS.
OUMR	• Coordinates the generation, maintenance and distribution of documents related to SEAs with the EMS MR (see EMSP 446a).

PROCEDURE

1. **The EMS MR will:**

a. Ensure the Environmental Policy is modified and signed to the satisfaction of the commanding officer within 90 days of a change of command. All documentation shall subsequently be reviewed to ensure continued agreement with the Environmental Policy.

b. Ensure that current versions of relevant documents are available through the DCRS.

c. Ensure that any retained obsolete documents are reviewed for legal and/or knowledge preservation purposes and identified as historical documents.

d. All superceded documents that were available through the DCRS are placed into the "superceded" file of the EMS Manual. The first page is marked "This Document has been SUPERCEDED."

2. **The OUMR will:**

a. Ensure that obsolete copies of documents are removed from the OU, as directed by the EMS MR, to assure there is no unintended use. If retention is necessary for legal and/or knowledge preservation purposes, then document must be identified with a "REFERENCE ONLY" stamp.

b. Review EMS documents related to the development of SEAs (see EMSP 431) each EMS cycle (see EMSP 46), and revise such documents as necessary.

c. Retain obsolete hard copy documents related to the control of SEAs for two years and identify the documents as historical documents.

3. **The ESC will:**

a. Assist in the control of EMS documentation by addressing the continuing suitability, adequacy and effectiveness of critical documents during management review as determined by the EMS MR (see EMSP 46).

4. **The EPO will:**

a. Generate, maintain, distribute and execute procedures for the control of environmental compliance plans and documentation.

b. Review, revise as necessary, and approve for adequacy environmental compliance plans and documentation.

c. Review obsolete documents for legal and/or knowledge preservation purposes and identify those retained documents as historical documents.

References

ISO 14001:1996, Section 4.4.5

EMSP 431 Environmental Aspects

EMSP 443a Internal Communications

EMSP 444b Other Plans and Documents

EMSP 453 Records Management System

EMSP 446a Operational Control

EMSP 46 Management Review

Document Edited By:
Form Rev 1.0.2 15 APR 2000

Sample Document Index

(sample indicates individual that revised document, his/her position/department and date(s) of revision)

Revision Number

Document	1	2	3	4	5	6
Environmental Policy	*John Smith Plant Manager 1/1/98*	*John Smith Plant Manager 1/1/99*				
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)						

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Operational Control

4.4.6

Section I

"Operational Control" from NSF Guide

"Developing Operational Controls" from EPA IEMS Guide

"Operational Control, Monitoring, & Measurement" from NSF Metal Finishers Guide

"Operational Controls" from Colleges and Universities EMS Guide

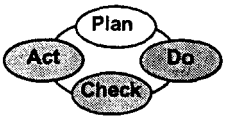
Section II

Charleston Public Works Operational Control Procedure

Naval Aviation Depot North Island Operational Control Procedure

Virginia Department of Environmental Quality Operational Controls Statements

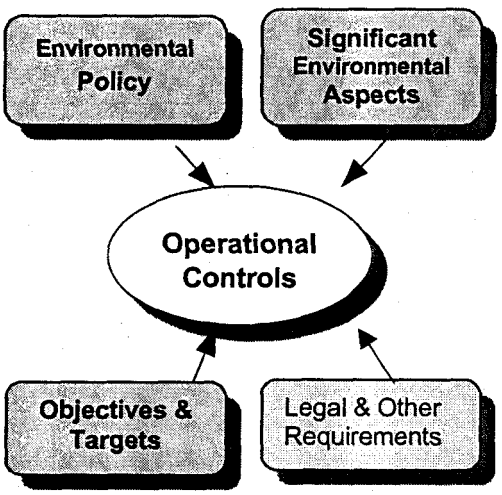
Comments:



Operational Control

Building environmental performance into operations and activities

Figure 9



To ensure that you satisfy the commitments in your environmental policy, certain operations and activities must be controlled. Where operations or activities are complex and/or the potential environmental impacts are significant, controls should include documented procedures. Procedures can help your organization to manage its **significant environmental aspects**, ensure regulatory **compliance** and achieve **environmental objectives**. Procedures can also play a prominent role in employee **training**.

Documented procedures should be established where the absence of procedures could lead to **deviations from the environmental policy** (including the commitments to compliance and pollution prevention) or from your **objectives and targets**. Determining **which operations** should be covered by documented procedures and **how** those operations should be controlled is a critical step in designing an effective EMS. Keep in mind that you might need operational controls in order to manage significant aspects or legal requirements, regardless of whether you established objectives and targets for each of them.

In determining which operations and activities need to be controlled, look beyond routine production or service. Activities such as **equipment maintenance**, management of on-site **contractors**, and services provided by **suppliers or vendors** could affect your organization's environmental performance significantly.

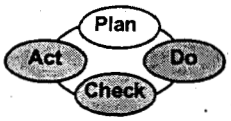
Examples of activities and operations that might require operational controls:

- ☑ management / disposal of wastes
- ☑ approval of new chemicals
- ☑ storage & handling of raw materials and chemicals
- ☑ equipment servicing
- ☑ wastewater treatment
- ☑ operation of paint line
- ☑ operation of plating system
- ☑ management of contractors

Getting Started:

- Start by looking at the **environmental aspects** and **legal requirements** that you identified earlier. Identify the **operations** and other activities that are related to these significant impacts and legal requirements, then consider what types of controls might be needed to manage these aspects and compliance requirements. If you have **flow charts** of these processes (or can develop them), this may simplify the identification of the process steps where some type of control might be appropriate.
- Prepare draft procedures and review them with the people who will need to **implement** them. This will help to ensure that the procedures are appropriate, realistic and practical. Don't be surprised if reviewers come up with a simpler way to achieve the same results!

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Hints:

- Review procedures you already have in place to **comply with** environmental and health & safety **regulations.** Some of these may be adequate to control significant impacts (or could be modified to do so). Develop a chart to keep track of what controls are needed, such as:

Operation or Activity	Procedure is needed (none exists)	Procedure exists, but is not documented	Procedure exists and is documented	No procedure is needed
1	X			
2		X		
3		X		
4			X	

- **Rules of Thumb**: In general, the more highly skilled and trained your employees are, the less critical documented work instructions become. As work becomes more complex or as the potential impact on the environment increases, the more important these documented work instruction will be.

- Once you have identified operations that require control, consider what kinds of maintenance and calibration may be appropriate. **Maintenance** of equipment that could have significant environmental impacts or result in non-compliance should be considered, and the need for a plan to manage such maintenance should not be overlooked. An elaborate preventive or predictive maintenance program is **not** needed in all cases. Assess your existing maintenance program and its effectiveness before making significant changes.

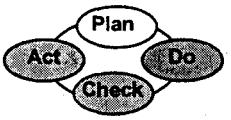
Factors that could affect the need for documented procedures

- ☑ risk of activity
- ☑ complexity of activity / methods
- ☑ degree of supervision
- ☑ skills / training of workforce

Hints on Writing Procedures

- Understand the existing process. Start with a flow chart, if one is available. Build on informal procedures where possible.
- Focus on steps needed for consistent implementation.
- Use a consistent format and approach.
- Review draft procedures with employees that will have to implement them. (Better yet, enlist employees to help write them.)
- Keep procedures simple and concise. Excessive detail does not provide better control and can confuse the user.

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- Some of your identified environmental aspects may relate to the chemicals, raw materials, or other goods and services you obtain from **vendors/suppliers**. Likewise, the activities of your **contractors** can affect your environmental performance. **Communicate your expectations** (including any relevant procedures) to these business partners.



- ***Policy***
- ***Environmental Aspects***
- ***Legal/Other Requirements***
- ***Objectives & Targets***
- ***Training***
- ***Monitoring & Measurement***

- While the development of procedures can be time-consuming, organizations have come up with creative ways to reduce the burden. For example, consider using a college intern or temporary employee to interview employees "on the line", collecting information on what employees do and how they do it.

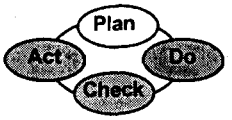
- If your organization uses a "work team" concept, ask the work teams to draft procedures for their work areas (or to modify existing procedures for EMS purposes).

☆☆ *POLLUTION PREVENTION* ☆☆

Rochester Midland Corporation, a manufacturer of cleaning and other chemical products, formed a partnership with a cleaning contractor that uses Rochester Midland's products, the owners of a building where the products are used, and building tenants, to lessen the risks associated with cleaning products. The partners began by developing common goals, identifying alternative cleaning products and processes, and identifying opportunities to reduce risks to building occupants and cleaning staff. Over a two-month period, they were able to: reduce chemical exposures; improve tenant satisfaction; improve communication, awareness, and training; achieve a 50% reduction in cleaning products; and achieve measurable cost savings.

For EPA's Performance Track program, organizations must have operation and maintenance programs for equipment and operations that relate to legal compliance and significant environmental aspects.
See Appendix B for more information.

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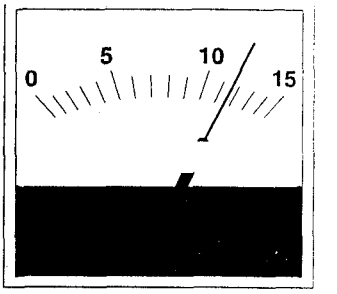


Capture the Learning: Operational Controls Worksheet

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**?	
What operations and activities are associated with **legal requirements**?	
What operations and activities are associated with environmental **objectives and targets**?	
How are the above operations and activities **controlled**? (list methods)	
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?	
Our next step on operational control is to ...	

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MODULE 6: DEVELOPING OPERATIONAL CONTROLS



As mentioned at the end of Module 3, for every environmental aspect your company determines to be significant (SEA), it is desirable that one of two actions be taken. Action may include either:

- Evaluating alternatives to make changes in processes in order to reduce the potential for impact, or
- Writing operational control procedures for activities or steps in a production process where the potential impact may be well controlled.

In writing operational controls for an SEA, determine the environmental objectives desired, set targets for performance and write operational controls (procedures) to ensure that the objective will be met. Your company may already have procedures in place. These should be reviewed to be sure they are consistent with EMS objectives. This module describes the process for setting objectives, developing operational controls, and creating the organizational support for ensuring that those objectives are met.

☞ Tip

ISO 14000 requires action to be taken on each SEA. If you are not pursuing ISO certification at this time, you could focus on selected SEAs.

If you determine that process changes should take place in order to address an SEA, the IEMS emphasizes the need to evaluate alternatives before setting targets. Module 4 describes the process for evaluating alternatives.

☞ Tip

Objective: Overall environmental goal, based on the environmental policy, which is quantified where practicable.
Target: Detailed performance requirement based on an environmental objective.

The following are some examples of the kind of activities that might be improved with operational controls[6]:

- management/disposal of wastes,

[6]Adapted from *Environmental Management Systems: An Implementation Guide for Small and Medium-Sized Organizations.* See References (Appendix G) for more information.

- approvals for using new chemicals,
- storage & handling of raw materials and chemicals,
- wastewater treatment,
- building and vehicle maintenance,
- transport,
- operation and maintenance of equipment,
- management of contractors,
- marketing and advertising, and
- acquisition or construction of property and facilities.



Experience has demonstrated the importance of written procedures and thorough employee preparation and involvement.

The process of setting targets and ensuring their success has several steps which are discussed in more detail below. These include:

- determining the possible causes of potential impact,
- setting measurements for the desired environmental performance,
- drafting operational controls,
- designating persons responsible for maintaining operational controls and for reviewing the success of the controls,
- developing training for persons assigned responsibility,
- taking corrective action when objectives are not met, and
- establishing a DfE environmental review for new processes and products.

1. Determine the possible causes of potential impact

For all of your significant environmental aspects, you should determine the cause of the impact. In some cases, the cause might seem obvious. However, sometimes the root cause of the problem is not the most obvious cause. Use the "root cause" analysis described in Module 5 to help your EMS team get to the cause of the impact prior to developing your operational controls.

2. Set targets and measurements for environmental performance

As discussed in Module 5, you need to set a target for each objective and establish measurements for environmental performance indicators. The targets should reflect correction of the root cause identified above. Measurement indicators should document changes in the causes identified above. Using the indicators, you can determine if your operational controls are helping you meet your objectives.

3. Draft operational controls

Next, for each significant aspect which you have decided to address with procedures, draft operational controls. (For some aspects, you may choose to make process changes instead, as explained in Module 4.) Review each of the causes identified in your root cause analysis that would contribute to the environmental impact of a significant aspect. Address the causes by drafting operational controls.

Operational controls may already exist for some of the activities associated with a significant aspect. Identify which aspects have written procedures that describe operational controls, and which aspects will need to have procedures developed. In some cases the procedures that you have in place to comply with environmental and health and safety regulations may be useful to meet your IEMS objectives. Worksheet 6-1 below will help you track which aspects will require procedures to be developed.

☞ **Tip**

DfE Partner Jeff Adrian of the John Roberts Company has provided operational control examples. See the Case Study at the end of this module.

Worksheet 6-1:* Operational Control Procedures

Significant Environ-mental Aspect	Indicator(s)	Associated Job Functions	Existing Operational Control Procedures	Operational Control Procedure Development/ Modification Needed	Responsible for Developing	Responsible for Checking	Location Posted
Waste Toner Cartridges	Number of Toner Cartridges recycled compared to number purchased	Copy machine maintenance	none	yes / new	Office manager	Office manager	Over copy machine
Contact Person:					Date Completed:		

*Corresponds to OC-01 in the *Company Manual Template.*

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

- Meet with workers and have them describe current procedures. Discuss the environmental objective desired, and how to write operational controls (procedures) to ensure that the objectives will be met.
- Or, 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.
- Keep the 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.

4. Designate responsibility for maintaining and reviewing controls

Designate those people responsible both for maintaining the controls and for reviewing them to ensure that procedures are followed and deviations corrected. Generally, the workers responsible for the significant aspect under consideration will be responsible for implementing the 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. Worksheet 6-2 will help with documenting responsibilities.

Worksheet 6-2: Operational Control Responsibilities		
Significant Aspect	**Procedures (list)**	**Responsible for maintaining controls**
Waste toner cartridges	-save package from new toner cartridge -place waste cartridge in package -follow supplier instructions for return of used toner cartridges	Copier maintenance person
Contact Person:		Date Completed:

5. Develop training

Achieving success in meeting environmental objectives for each significant aspect 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 everyone understands both the controls and their own role in ensuring that they are followed. Training can include on-the-job training. Worksheet 6-3 identifies some of the decisions to be made when setting up a training plan. This worksheet helps you identify, plan for, and track the training needs of your employees. Include this training with any general environmental training to create an integrated training plan for your IEMS. See the John Roberts case study at the end of this module for an example of training materials one printing facility prepared to support an operational control.

☞ Tip

The training described here relates to operational controls. More information on training for environmental awareness and regulatory training can be found in Module 8.

Worksheet 6-3: Training Plan for Operational Controls

Aspect	Procedures	Person Responsible for Carrying Out	Training Needs	How to Train	When/ Length	Budget	Completion Date	Person Responsible for training
Waste Toner Cartridges	For Recycling	Copier Maintenance Person	Recycle Procedure	Office Manager Explain	When assigned copier maintenance duties/ 20 min	N/A	Within one week of taking job responsibility	Office Manager
Contact Person:						Date Completed:		

6. Take corrective action when objectives are not met

Take action to correct failures in operational controls as quickly as possible to meet environmental objectives. Use the process in Module 5, to take appropriate corrective action when your operational controls are not helping you meet your objectives.

☞ Tip

If the problem cannot be resolved, review Module 4 to determine a need for evaluating alternatives.

CASE STUDY FROM THE JOHN ROBERTS COMPANY

Example of an Operational Control For Cleaning Press Blankets

Steps

1. On the first turn of the cylinder, use a solvent saturated shop towel pad (as is the current practice) to loosen and remove most of the ink from the blanket's surface.
2. With a second shop towel pad that has been first dipped into water and then wrung out, remove the balance of the ink from the blanket's surface on the second turn of the cylinder.
3. Start the press as before.

Critical points

By *not* using water on the first turn of the cylinder, the full strength of the Press Wash is available to move the ink. So, do not blend down Press Wash with water.

It is *not* necessary that the blanket be *absolutely* dry after the second turn of the cylinder. Rather, a slight film of water (think of how the sidewall of your car's tires look after just washing the car) will not be problem on startup of the press. The first few sheets will very easily carry this moisture off.

By using a second pass with a water wipe, clays, starch and paper dust are better removed. A water wipe should be easier to slide across the blanket than a drywipe.

Care does need to be taken in just one respect, and that is in the area of the blanket cylinder's grippers. Excess Press Wash or moisture there has the potential of being spun off the cylinder onto the stock if not removed.

Towel usage

When the solvent shop towel pad is dirty, discard it in the safety cans as before.

The water wipe shop towel pad now becomes the solvent shop towel pad and a new pad (from clean shop towels) is made up for the water wipe step.

CASE STUDY FROM THE JOHN ROBERTS COMPANY

Example of Training for Operational Controls

As part of training, the Director of Environment and Safety distributed additional materials to all employees involved with press blanket cleaning. Because this operational procedure documents a new and standardized method, there were many questions from employees. The director prepared additional written information, including: 1) a background sheet telling employees why this procedure was important, and 2) a Q&A list addressing issues that had come up in training.

These materials and the associated training were done to ensure that employees knew why the procedure was needed and what part they were to play in consistently implementing it.

Training for Press/Blanket Washing

New Procedures Background

Background

As some of you may already know, the elimination of Blanket Wash 2215 is necessitated by the tightening of environmental regulation.

Blanket Wash 2215 is a blend of solvents that includes the chemical 1,1,1 Trichlorethane (TCA), a chemical that has been banned internationally by the Montreal Protocol..

The reason for this is that TCA is an upper level ozone depleter, destroying the ozone layer that shields us from the harmful effects of the sun's ultraviolet radiation.

While still being manufactured today, TCA is being taxed at ever higher rates until it will no longer be manufactured in 1995.

Additionally, because Blanket Wash 2215 evaporates readily to the atmosphere, the other chemicals in the blend contribute volatile organic compounds (VOC's), which when combined with nitrogen oxides (from the burning of fossil fuels) and sunlight, leads to the formation of smog in the lower levels of our atmosphere.

The replacement for Blanket Wash 2215 will be the use of the much less volatile, and thus less harmful, Press Wash.

Because Press Wash solvent works at a different rate that the discontinued Blanket Wash 2215, a new cleaning procedure will have to be followed.

This new procedure, though somewhat different than today's method, will work nicely to clean press blankets.

CASE STUDY FROM THE JOHN ROBERTS COMPANY

Training for Press/Blanket Washing Questions You May Have

If we can still buy solvent blends that contain some 1,1,1 Trichlorethane (TCA), why do we need to make the change now?

Well, there are several reasons. First, there are some health concerns with TCA, so we want to eliminate any exposure as much as we possibly can. Second, in an effort to discourage the use of TCA now, the government is increasing taxes on this chemical (and other targeted chemicals), making the product unduly costly. Third, this is a reportable usage chemical, which requires that we complete Form R (a complicated procedure) that is also public information. It is better that we have no reportable chemical usage because if we do, then we are also brought into the regulatory loop on many other time consuming and costly programs. Fourth, John Roberts has made a commitment to *reduce* its total emissions as part of the Minnesota Toxic Pollution Prevention Plan and we will be accountable for reaching these goals. Fifth, as a responsible member of the community (in which many of us live as well as work), it is the right thing to do for the betterment of our environment.

Will this new procedure slow down my work and reduce my productivity? Will I be penalized because of this?

Unquestionably, this new procedure will slow things down slightly, but not by much. Even with the older Blanket Wash, pressmen would often use two turns of the cylinder to complete the cleanup of the blanket. Understanding that the blanket does *not* need to be *completely dry* will save otherwise wasted time. So the only remaining time element is the need to switch to a water wipe shop towel pad and the time to take care to wipe the blanket ends, especially the cylinder gap. Management's commitment to environmental responsibility supports your efforts.

What if I find I need more shop towels? Won't this new procedure use a lot more shop towels?

If it turns out that you need more shop towels, they are available (we ordered extra last week and have them in stock). Testing that we have already done has shown that towel rotation (where the water wipe pad becomes the new solvent wipe pad and clean towels are then used for the new water wipe pad) works very well.

Can I use a sponge instead of a shop towel pad for the second (water) wipe?

Yes, it's possible to use a sponge instead of a padded shop towel for the water wipe. But if you do choose to use a sponge, you will have to use less wiping pressure or you will squeeze the water out of the sponge onto the blanket leaving the blanket too wet. Try it and see if you like it. You may find a shop towel water wipe easier to control.

Can I mix water with the Press Wash and do it all at one time? Why might this not be a good procedure?

Yes, again it's possible to do this, but it's not recommended. Here's why. When you add water to Press Wash, you dilute the Press wash's ability to cut the ink in the first place. This may mean more work and slower cleaning. Also, Press Wash contains surfactants that make it able to mix with water, and it is these surfactants that tend to remain on the "clean" blanket that cause problems with both the ink roller train *and* the water fountain systems. It's good to

remove surfactants as completely as possible, and this is best done with a separate water wipe.

Can I just use a dry shop towel pad to wipe the blanket completely dry instead of a second water wipe? Would I be better off?

Well, for the reasons listed above, it's not recommended to use a dry shop towel second wipe. Aside from the fact that some feel a dry shop towel is harder to move across the blanket (it tends to drag), how would you clean the blanket of water solubles such as starches, clays and paper dust? The only reason I can think of to completely dry the blanket would be to ease your fear of "throwing"solvent drops on the work after startup. This is addressed by taking a little care on the second (water) wipe, especially at the ends of the blanket in the cylinder gap.

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3.1 Operational Control, Monitoring, and Measurement [ISO 4.4.6, 4.5.1]

What the ISO Standard Requires

The ISO Standard covers environmental operations in two sections: Operational Control and Monitoring and Measurement.

Section 4.4.6 (Operational Control) requires the facility to establish the necessary procedures so that all of its operations and activities related to significant environmental aspects (as covered in the sections on policy, objectives and targets) are working as intended. Procedures must specify the necessary operating criteria (for example, flows and concentrations in regulated wastewater discharges). This also must include the significant aspects of goods and services used by the facility. This means that some suppliers and contractors may also be covered by some of the operational procedures, such as in maintenance and purchasing.

Section 4.5.1 (Monitoring and Measurement) requires the facility to have procedures to collect the information necessary to ensure that they are actually achieving the desired outcomes for environmental management. This includes tracking performance towards achieving objectives and targets, meeting the specified operating criteria in procedures, and periodically evaluating compliance with relevant environmental legislation and regulations. Any equipment used to measure or monitor performance (for example laboratory equipment, meters, and scales) must be calibrated and maintained as specified in the operating procedures.

Starting Points

Most of the metal finishers in the project felt that they needed to make improvements in providing written procedures for their environmental operations. A few of the larger shops already had written operating procedures that covered most standard environmental operations (for example, wastewater treatment and discharge, air pollution control, and hazardous waste storage and shipment). Several of the smaller shops had no written procedures (other than specific work instructions related to equipment and process control). Only minimal procedural information was available on checklists and log sheets used to record information necessary to comply with regulations.

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Implementation Tips

1) The main difficulty in addressing these elements of the EMS is to know where to start and when to stop when documenting procedures. Think about which procedures must be written down before you begin to write them, and attempt to keep the number of documented procedures and work instructions to a minimum. This section of the standard tends to be the place where most EMS implementation efforts get bogged down.

2) Procedures must cover significant environmental aspects in line with your policy, objectives, and targets. One way to tell if you need a procedure is to ask this question: If you didn't have these written procedures, would you have problems in deviating from your environmental policy, or would you be unable to meet your targets and objectives? For example, if reducing your wastewater discharge rate is one of your objectives, at a minimum you would need to check to be sure that you had documented the necessary operating criteria, procedures, and instructions. This would include for example, specifying what discharge rates are acceptable (or what is not acceptable), and writing instructions to cover activities that affect the discharge rates (e.g. rinse rates, tank dump schedules, maintenance activities).

3) Procedures must also provide for the collection of information necessary to track and evaluate performance. This includes keeping records (for example, log sheets or checklists), and ensuring that the information collected is accurate (by calibrating any equipment used in monitoring or measurement).

4) One way of starting the process of documenting operational procedures is by making a list of key operating criteria related to your significant environmental aspects, objectives and targets. Based on this list, you can identify the related procedures, work instructions, and records. These may already exist, or you may have to develop new ones. For an example, see the Key Operations Worksheet in the next section. You should cover three main types of activities in defining your key operating criteria:

   - activities related to on-going regulatory compliance
   - activities related to achieving objectives and targets as specified in your environmental management program
   - activities related to emergency prevention and response

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5) Don't forget to consider activities related to maintenance, and to outside contractors, and suppliers, in documenting your operational procedures. These would include any activities related to emergency response; to compliance; and to meeting objectives and targets. Contractors and suppliers that provide these types of activities must be covered by the appropriate procedures and informed by the facility when they apply. For example, you may require vendors to provide Material Safety Data Sheets to allow control of samples and test materials. All vendors must be informed of this requirement.

6) In writing procedures and work instructions, strive to keep them simple. Bulleted or numbered lists may be more useful than a lot of text. Pictures or graphics also help to make things more clear. Include appropriate sample record forms (e.g. log sheets, checklists).

7) Be sure that you are actually doing what you say you are doing. If you are already performing a particular activity (for example, shipping hazardous waste), start by simply "saying what you do." Some facilities have found it helpful to use an outside person who is not familiar with the operation to start the process of documenting procedures. It is sometimes easier to capture the essential points quickly if you are not the expert. Then, others can review the draft procedure to be sure that it is accurate, and revise it as necessary. Remember that these procedures will also play a key role in on-going training of employees who perform these activities.

8) Check to be sure you have included the necessary procedures for Monitoring and Measuring with your operational control procedures. The ISO 14001 Standard requires procedures related to monitoring and measuring key characteristics of operations that can have a significant impact on the environment. These procedures could be incorporated into existing procedures (such as process or quality control procedures), or could be a stand-alone procedure. Again, the choice should be made based on the existing management system documentation.

9) Check to be sure that you have the necessary procedures to enable you to meet your environmental policy objectives. For example, if you state that you utilize the most energy efficient technology available, be sure that your engineering and purchasing procedures include appropriate language to actually achieve this.

10) You must have a means of periodically evaluating your compliance with applicable environmental regulations. Decide how you will accomplish this. You may wish to develop a compliance audit procedure. Seek

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advice from your company's attorney to be sure that your approach is legally sound.

Examples

1) Build on existing operational control procedures. Several facilities had existing methods for documenting essential day-to-day operational procedures, generally related to their ISO or QS-9000 Quality Management System. They started development of their environmental operational procedures by reviewing existing standard operating procedures. Then they determined which procedures required revisions (or needed to be added) based on their EMS requirements. Other facilities chose to develop a stand-alone Environmental Operations Manual, because they already had an existing manual and/or operational procedures in place. Both of these approaches are acceptable. Use whatever system works best for you.

2) Use a master environmental operational control procedure to serve as the main reference document. Several of the metal finishers involved in this project established a "master" environmental operational control procedure. This procedure serves as the "umbrella" and references all of the related environmental procedures and documentation. The related procedures are typically located in several areas of the facility (for example, in SOP manuals, waste water operating manuals, lab manuals, maintenance manuals, and other company procedural manuals). Additionally, the master procedures included information related to EMS procedures not covered by other procedures (for example, activities related to contractors and suppliers).

3) Use a Key Operations Worksheet to decide which procedures need to be documented. Several of the metal finishers used a Key Operations Worksheet to decide which procedures needed to be developed. The Worksheet also served as a reference document for the master Environmental Operational Control Procedure.

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A sample Key Operations Worksheet included the following headings:

- ❑ Environmental Aspect or Target
- ❑ Related Area or Function
- ❑ Specific Control Criteria (for example, permit conditions, standard operating parameters)
- ❑ Related Procedures (name and number, location)
- ❑ Related Work Instructions (if applicable)
- ❑ Related Records
- ❑ Related Calibration Procedures (if applicable)

4) Develop an Environmental Operations Log to serve as a master document list. Any standard operating procedures and work instructions that are designated as part of the EMS should be clearly identified as such. One simple way of accomplishing this is to provide a master table or log sheet, which can also become part of the master Environmental Operational Control Procedure. The table should include information about distribution, locations and responsibility for developing and maintaining procedures. This greatly simplifies the process of making changes and in auditing the system.

Headings for an Environmental Operations Log typically included:

- ❑ Title of Procedure
- ❑ Date of Last Revision
- ❑ Responsibility for Developing and Maintaining Procedure
- ❑ Distribution of Procedure (by name or job function and location)
- ❑ Related Work Instructions
- ❑ Distribution of Work Instructions (name or job function and location)
- ❑ Related Records
- ❑ Responsibility for Record Keeping

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Conformance Check

Operational Control (ISO 4.4.6)

The ISO 14001 Standard does not require written procedures for every operation and activity but they are required for operations and activities associated with significant environmental aspects, the environmental policy, and objectives and targets. In the following example one project participant developed guidelines on the management of their operational control procedures:

> Scope: This procedure applies to the areas where lack of controls could cause a significant environmental impact for XYZ, Inc.
>
> The EMS Group shall conduct an evaluation throughout the shop to identify which of XYZ Inc.'s operations, activities and services are significant environmental aspects.

Metal finishers generally overlooked the role of the environmental policy and objectives and targets in establishing operational controls.

You should not assume that your EMS is in conformance to the standard if you have procedures for all operations within your shop. You may have an objective (e.g., recycling paper waste, reducing electricity usage) that is not based on a significant aspect but which requires a procedure under the operational control requirements.

There are two other requirements under operational controls that are often overlooked: planning maintenance activities and communicating with subcontractors. Half of the metal finishers overlooked maintenance in the operational control procedures reviewed. The other half of metal finishers noted preventative maintenance (for equipment used in plating process) as part of the quality process control procedure.

The metal finishers did included subcontractors in their general operational control procedures, for example:

> XYZ Inc. shall establish and maintain a procedure that shall assist in the identification of significant environmental aspects of goods and services being used by XYZ. XYZ will communicate any relevant procedures and requirements to its suppliers and subcontractors.

Another metal finisher submitted their quality procedure for selecting and evaluating subcontractors as meeting the requirements under

"Operational control" but had not modified the procedure to address ISO 14001 Standard requirements.

Monitoring and Measurement (ISO 4.5.1)

The monitoring and measurement portion of the ISO 14001 Standard can be confusing to implement because it contains a variety of requirements from tracking objectives and targets to calibrating and maintaining equipment to evaluating compliance with environmental regulations. The metal finishers seemed to understand these varied requirements and developed general guidelines for meeting all the requirements.

However, monitoring and measurement is one of the few elements of the standard where formal written procedures are required. Procedures are required for:

Monitoring and measuring key characteristics of operations

Evaluating compliance with environmental regulations

In the first area, the metal finishers gave a good description of the general process for monitoring and measurement: how data would be collected, what would be calibrated and how, who was responsible, and provided references to relevant procedures.

In the second area, a typical description of a compliance program follows:

> XYZ Inc. shall periodically evaluate compliance utilizing relevant environmental legislation and regulations.

This statement is a re-wording of the standard requirement and does not constitute a procedure. With this statement alone, XYZ Inc. would receive a nonconformance during an EMS audit (either internal or external). Another metal finisher tried to describe their regulatory compliance verification this way:

> Sampling and testing of waste streams is performed according to documented work instructions.
>
> The primary source of regulatory compliance verification is through daily sampling of the wastewater treatment system discharge.

In addition to being very narrow in scope, these brief statements do not describe a procedure for periodically evaluating compliance.

The requirement to evaluate your level of environmental compliance is an important part of the standard and is directly linked to your environmental policy (commitment to compliance). The evaluation may be combined with other evaluations that you do (such as safety or health) but the standard requires a procedure.

EMS Links

Operational Control (ISO 4.4.6)

- Policy; Environmental aspects; Objectives and targets: As noted above, the operations and activities associated with these three elements of the standard must be identified before you determine which of these operations/activities require operational controls.

- Training, awareness, and competence: Operational control is one of the few elements of the ISO 14001 Standard where written procedures are required. The training requirement of the standard states that employees should be aware of their roles and responsibilities in achieving conformance with procedures and on the importance of conforming with procedures. Therefore, employees should receive training on operational control procedures.

- Monitoring and measurement: On a functional level, operational controls often include requirements for monitoring and measurement of equipment, processes, emissions, or discharges.

Monitoring and Measurement (ISO 4.5.1)

- Policy: The link with policy is clear: the environmental policy commits your facility to comply with regulations and under monitoring and measurement, you must develop a procedure describing how you will evaluate your compliance status. A less obvious link with policy is through the objectives and targets. The policy should set the framework for establishing objectives and targets and under monitoring and measurement, you should be tracking your progress in meeting your objectives and targets.

- Environmental aspects; Objectives and targets: The planning elements of the standard require that you identify aspects and establish and maintain objective and targets. Monitoring and measurement requires that you track your performance in meeting objectives and targets.

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- Training: Employees must be aware of the procedures that govern their work including any monitoring or measurement that is part of their job.

- Operational controls: The link between operational controls and many of the requirement under monitoring and measurement is direct. The standard states that your are required to track performance, *operational controls*, and conformance with objectives and targets. In addition, some of your equipment or process monitoring may also be part of your operational control procedures.

- Environmental management systems audit: The results of the program you establish to evaluate environmental compliance will provide input to your internal EMS audits.

- Nonconformance and corrective and preventive action: Any regulatory noncompliance that you identify as a result of monitoring and measurement (including your compliance evaluation procedure) would be a nonconformance of your EMS. The noncompliance should be followed-up according to the process you set in place under the nonconformance and corrective and preventive action requirement.

ELEMENT 2.4

OPERATIONAL CONTROLS

Operational controls are documented procedures that apply to operations with significant environmental aspects or operations related to EMS objectives and targets. The purpose of operational controls is to build environmental performance into daily C/U operations. While the rationale for creating operational controls is to minimize environmental concerns and achieve consistent compliance, as a practical matter writing and managing procedures for the numerous and diverse operations at a C/U would be burdensome and time-consuming. Therefore, C/Us should exert discretion as to the number and focus of written operational controls to ensure that the procedures that are written are clearly communicated and genuinely implemented. Often, procedures will already exist for operations with significant environmental aspects in which case the EMS should reference such documentation.

Operational control procedures should be considered if activities are causing compliance or liability problems, are completed inconsistently by different people, or require complex recordkeeping. Procedures should state (1) to whom the procedure applies, (2) to which operations the procedure applies, (3) steps that must be followed to complete the operation or activity, and (4) any training required to execute the procedure properly. Examples of C/U operations that might require written control procedures include:

- ✓ Hazardous materials management
- ✓ Hazardous waste handling storage and disposal
- ✓ Laboratory chemical tracking and use
- ✓ Pest management (typically in the form of integrated pest management plan)
- ✓ Fuels management (fueling, storage, and spill prevention)
- ✓ Worker safety

In many cases, operational controls less formal than written procedures are equally effective. For example, an inspection log for the hazardous waste storage area, brief checklists, or signs with simple instructions can be simple operational controls. One such example of a procedure and checklist covering storm water inspections is included in this element.

Implementation: *Procedure 2.4, Operational Control,* describes how to identify what operational controls are needed. The Operation Control form can be used to document operations for which written control procedures are required; both existing procedures and procedures developed as part of this EMS should be recorded.

SAMPLE PROCEDURE ONLY – REVISE AS NEEDED

[C/U Name]	EMS Procedure	2.4
	Effective Date	
	Subject	Operational Control

Purpose This procedure is used to document and track which [C/U Name] operations with significant environmental aspects require operational controls.

Step 1 Using the list of significant environmental aspects developed from the aspects review completed as part of *Element 2.1, Environmental Aspects and* Impacts, the EMS Manager will identify [C/U Name] operations that potentially require written procedures.

Step 2 The EMS Manager will then identify operations for which operational control is achieved through existing procedures or practices.

Step 3 The EMS Manager with the assistance of appropriate [C/U Name] departmental and facility staff, will identify operations with significant environmental aspects that require new procedures to achieve operational control.

Step 4 Depending on the significance and liability associated with a given operation, the EMS Manager, with the assistance of appropriate [C/U Name] departmental and facility staff, will determine the level of detail, training required, and frequency of review and revision for each operational control; details will be recorded in the procedure for each operation.

Step 5 Documentation of operational control will be achieved using the Operational Control form and will be retained by the EMS Manager.

Responsible Person: _____

Signature and Date: _____

Operations	Significant Aspect	Procedure Title	Frequency of Review	Responsible Party

Responsible Person

Effective Date

EXAMPLE

Operations	Significant Aspect	Procedure Title	Frequency of Review	Responsible Party
Hazardous Waste Management	Potential Leaks, Spills	Hazardous Waste Storage Area Checklist	Weekly	Maintenance Supervisor
Grounds Maintenance	Potential Contamination of Campus Hill Brook	Storm Water Visual Observation Form	See "Frequency" Section of Storm Water Form (Attached)	EH&S Technician
Wastewater Discharge To POTW	Potential Damage To POTW Potential Water Contamination	Wastewater Sampling Procedure	Monthly Annually (See POTW Permit Requirement)	Maintenance Supervisor

Example

Requirements

- ☐ **PROCEDURE**: Visually observe all storm water discharges for the presence of pollutants.
- ☐ **FREQUENCY**: One storm event per month during the wet season (October 1 - May 30), during the first hour of discharge, during daylight hours, during scheduled facility operating hours, storms that are preceded by at least three (3) working days without storm water discharges.
- ☐ **LOCATIONS**: (1) SW-01 – Storm Drains
  (2) SW-02 – Roof Downspouts
  (3) SW-03 – Storm Water Culvert
- ☐ **OBSERVATION**: Presence of any floating and suspended material, oil and grease, discolorations, turbidity, odor, and the source of any pollutants.

Observed By _____ Date _____

Title _____ Time _____

Month _____ Time Storm Started _____

Location	Describe Discharge	Describe Source of Discharge
SW-01 Storm Drains		
SW-02 Roof Downspouts		
SW-03 Storm Water Culvert		

Comments/Corrective Actions Taken:

Responsible Person

Effective Date

ELEMENT 3.1

ROLES AND RESPONSIBILITIES

An EMS should establish roles and responsibilities for environmental management. These roles and responsibilities must be clearly and effectively communicated to all employees. In addition, C/U administration should designate an employee who (1) ensures that the EMS is established and implemented; (2) reports on EMS performance over time; and (3) works with others to modify the EMS when necessary.

The size of the C/U and therefore the complexity of the internal structure will have a profound effect on the organization of personnel responsibilities for the EMS. Be cognizant of the size and characteristics of your C/U and plan accordingly when assigning roles and responsibilities. For example, smaller C/Us usually have less hierarchy, more direct lines of communication, and faster decision-making processes. And because staff at smaller C/Us often performs multiple functions, integrating environmental responsibilities with other functions can simplify the EMS structure and minimize use of resources. Medium-sized and large C/Us on the other hand may have significantly more specialized expertise and resources but also more bureaucracy; as a result, they must strive to break down interdepartmental barriers and operate collaboratively to create an efficient and functional EMS.

Implementation: *Procedure 3.1, Roles and Responsibilities*, describes how to assign responsibilities and determine organizational roles for the EMS. The procedure can be implemented, in part, through the Responsibilities Matrix and Organizational Chart. The matrix and chart should be used to plan and assign EMS responsibilities and can also be used to communicate these responsibilities to other people in the C/U. After EMS responsibilities have been assigned, it will be helpful to develop an organizational chart showing responsible employees, lines of communication and reporting, and any hierarchy that may be in place. In addition, an example C/U EMS organization chart has been provided as a possible starting point for developing one for your C/U.

Considerations in assigning and reviewing EMS roles and responsibilities:

- Personnel involved
- Training and resources required
- Results of previous audits
- Improvement of current structure
- Integration with other C/U functions and existing management systems

CPW ENVIRONMENTAL MANAGEMENT SYSTEM PROCEDURE

The on-line version and secured hardcopy are the controlled documents. The secured hardcopy will be identified by an "Official Document" stamp giving date of distribution. Any and all other documents are uncontrolled. Contact EMS Program Manager for revision level status.

Effective Date:	**October 1, 2000**	**Page 1 of 3**
Revision: 1	**Identification Number: EMS – 4. 4. 6 (A)**	
Title:	**Operational Control Procedure**	
Prepared By:	**EMS Procedures Subcommittee**	
Reviewed By:	**EMS Management Steering Committee**	
Approved By:	**William E. Koopman Jr., General Manager** **John Cook PE, Assistant General Manager**	
Date Approved:	**August 25, 2000**	

0.0 Requirement: ISO 14001, Sub Clause 4.4.6 Operational Control

1.0 Purpose

This procedure is used to ensure monitoring and operating instructions are properly identified, issued and controlled, and to ensure that all relevant documents necessary for the proper operation of the process are present.

2.0 Scope

This procedure applies to all associates who issue and control monitoring and operating instructions at CPW where EMS requirements are in place.

3.0 Responsibility & Authority

3.1 The department head (or designee) is responsible for the approval, revision, and issuance of monitoring and operating instructions and ensuring associates have the necessary training to perform the job.

4.0 Procedure

4.1 Issue and Control of Monitoring and Operating Instructions

4.1.1 Prior to placing new or modified monitoring or control equipment in service the department head will direct the drafting of monitoring or operating instructions for that operation.

NOTE: Monitoring and operating instructions should include the following information where relevant:

- Monitoring and Operating Instruction Title and Identification Number
- Process or equipment name
- Operating criteria
- Startup instructions
- Shut down instructions
- Emergency operation (loss of power, SCADA, etc)
- Inspection and test instructions
- Corrective action instructions
- Revision date and approval
- Safety requirements
- Housekeeping
- Location of manufacturer's reference material

4.1.2 The draft monitoring and operating instructions are submitted to the appropriate supervisor(s) to review for operability, completeness, consistency and clarity.

4.1.3 The supervisor(s) note any changes or concerns and forwards back to the individual or team that prepared the draft.

4.1.4 The individual or team that prepared the draft makes the necessary corrections.

4.1.5 The department head reviews and approves the new or revised monitoring and operating instructions.

4.1.6 The department head (or designee) issues the monitoring and operating instructions to the appropriate supervisor(s).

4.1.7 The supervisor(s) ensures the operators have the necessary training, including the environmental impacts or potential consequences in deviating from the specified work instructions.

4.1.8 The department head (or designee) ensures the documents are available and controlled at all appropriate locations, the most current versions are available for use, and obsolete versions are prevented from further use.

4.1.9 Obsolete documents to be retained for legal and or knowledge preservation are removed and marked "Obsolete.

4.2 Related Documents and Data

4.2.1 Training Records
4.2.2 Records of Change to related documented procedures
4.2.3 Manufacturer's Reference Material
4.2.4 Document Control Procedure

CPW ENVIRONMENTAL MANAGEMENT SYSTEM PROCEDURE

The on-line version and secured hardcopy are the controlled documents. The secured hardcopy will be identified by an "Official Document" stamp giving date of distribution. Any and all other documents are uncontrolled. Contact the EMS Program Manager for revision level status.

Effective Date:	**October 1, 2000**	**Page 1 of 3**
Revision: 1	**Identification Number: EMS – 4. 4. 6 (B)**	
Title:	**Maintenance Management Procedure**	
Prepared By:	**EMS Procedures Subcommittee**	
Reviewed By:	**EMS Management Steering Committee**	
Approved By:	**William E. Koopman Jr., General Manager**	
	John Cook PE, Assistant general Manager	
Date Approved;	**August 25, 2000**	

0.0 Requirement: ISO 14001, Sub Clause 4.4.6 Operational Control

1.0 Purpose

This procedure is used to ensure maintenance management Standard Operating Instructions (SOI's) are properly identified, issued and controlled to ensure proper maintenance of equipment and facilities.

2.0 Scope

This procedure applies to all associates who issue and control maintenance management Standard Operating Instructions at CPW where EMS requirements are in place.

3.0 Responsibility & Authority

3.1 The department head is responsible for the maintenance management program, approval of maintenance management standard operating instructions, and ensuring maintenance associates have the necessary tools and training to perform the required maintenance tasks.

3.2 The maintenance manager or (designee) is responsible for the development, revision and issuance of standard operating instructions and that maintenance tasks are performed in accordance with the applicable O&M manual(s), standard operating instructions and/or manufacturers' recommendations.

4.0 Procedure

4.1 Issue and Control of Maintenance Standard Operating Instructions

4.1.1 The maintenance manager will direct the drafting of maintenance management standard operating instructions (including preventive maintenance) for facility equipment, buildings and grounds.

NOTE: Maintenance management standard operating instructions should include or reference the following information where relevant:

- Standard Operating Instruction Title and Identification Number
- Revision date and approval
- Detailed maintenance criteria
- Procedural instructions on start up
- Procedural instructions on shut down
- Emergency operation (loss of power, SCADA, etc)
- Inspection and test instructions
- Corrective repair maintenance instructions
- Preventive maintenance procedures
- Safety requirements
- Location of manufacturer's reference material

4.1.2 Draft maintenance management standard operating instructions are submitted to the maintenance supervisor to review for completeness, consistency and clarity.

4.1.3 The maintenance supervisor notes any changes or concerns and forwards back to the individual or team that prepared the draft to make necessary correction.

4.1.4 The maintenance manager submits the new or revised maintenance management standard operating instructions to the department head for review and approval.

4.1.5 Upon approval the maintenance manager (or designee) issues the maintenance management operating instructions to the appropriate maintenance supervisors.

4.1.6 The maintenance supervisors ensures the maintenance crews have received the appropriate training for the maintenance task, including training on the environmental impacts or potential consequences in deviating from the specified maintenance management operating instructions on critical equipment and processes.

4.1.7 The department head (or designee) ensures the maintenance documents are available and controlled at all appropriate locations, the most current versions are available for use, and obsolete versions are prevented from further use.

4.1.8 Obsolete documents to be retained for legal and or knowledge preservation are removed and marked "Obsolete.

4.2 Related Documents and Data

4.2.1 Training Records
4.2.2 Records of Change to related documented procedures
4.2.3 Manufacturer's Manuals
4.2.4 Document Control Procedure

Naval Aviation Depot, Cl

ISO 14001 Procedure

Title	Document Effectivity	Status
Operational Control	First Issue Date 01/22/1999 Revision Date	Issued
EMS Procedure No	**EMSMR**	Rev
EMSP446a	Melito M Barrera/NI/NADEP	0

Purpose

To ensure documented internal working procedures are established and maintained for identified operations and activities, and are in line with NADEP's Environmental Policy, objectives and targets.

Scope

This procedure applies to the preparation of internal working procedures for operations and activities associated with SEAs (including maintenance) to cover situations where their absence could lead to deviations from the Environmental Policy, or objectives and targets.

Responsible Party	Responsibilities
EMS MR	• Coordinates the process for identifying the need for internal working procedures associated with SEAs (see EMSP 432 and EMSP 442). • Ensures that internal working procedures are prepared and maintained as necessary.
OUM	• Ensures that PAS are managed in a manner which minimizes environmental impacts.
OUMR	• Establishes and maintains internal working procedures to address objectives and targets, as necessary, which are within the control of the OU.
IPO	• Establishes and maintains internal working procedures to address maintenance, equipment and facility issues associated with environmental compliance requirements identified by the EPO. • Establishes and maintains internal working procedures to address maintenance, equipment and facility issues associated with objectives and targets identified by an OUMR, and within the control of the IPO.
EPO	• Assists the OUMRs, as necessary, in the preparation of internal working procedures.

PROCEDURE

1. **The EMS MR and the OUMR will:**

a. Assess the need for internal working procedures each EMS

cycle (see EMSP 46).

b. Assign responsibility for preparing and implementing internal working procedures. These procedures will include operating criteria.

2. The EPO will:

a. Establish and maintain documented internal working procedures to ensure NADEP operations are in compliance with environmental laws and regulations, corporate environmental objectives and EMS requirements. These instructions (see EMSP 444b) will include operating criteria, and will be reviewed at least annually and updated as necessary.

3. IPO and EPO will:

a. Review internal working procedures for maintenance, equipment and facility functions which have the potential to impact the environment at least annually and update these procedures as necessary. These procedures will include operating criteria where relevant.

4. General Guidance:

a. Operational Control issues related to ER&P are discussed in EMSP 447.

b. Roles and responsibilities for operational control of the procurement of goods and services are discussed in EMSP 446b.

References

ISO 14001:1996, Section 4.4.6

EMSP 432 Legal and Other Requirements

EMSP 442 Training Awareness and Competence

EMSP 444b Other Plans and Documents

EMSP 446b Procurement of Goods and Services

EMSP 447 Emergency Response and Preparedness

EMSP 46 Management Review

Document Edited By:
Form Rev 1.0.2 15 APR 2000

exhibits, and minutes of management reviews. All EMS records shall be permanently maintained unless and until Virginia's record retention policy establishes a lesser requirement.

8. Operational Controls

8.1. Operational Controls over Significant Impact Activities and Operations

Concurrent with its determination in February of each year as to which of DEQ's environmental aspects are potentially significant environmental impacts, the EMS Program Team shall identify the operations and activities associated with these potentially significant environmental impacts and direct the manager of the operation or activity involved to establish and maintain operational controls to avoid the occurrence of a significant environmental impact, deviations from the Environmental Policy, or failure to achieve environmental objectives and targets. The operational control opportunities identified shall become a part of the Environmental Objectives and Targets for the upcoming year.

8.2. Operational Controls for Goods and Services Used by DEQ

Concurrent with its determination in February of each year as to which of DEQ's environmental aspects are potentially significant environmental impacts, the EMS Program Team shall 1) review the goods and services used by DEQ and supplied by others and 2) determine the potential significant environmental impacts associated with these goods and services. The EMS Manager shall communicate relevant procedures and requirements to the suppliers and contractors of these goods and services in order to reduce the adverse environmental impacts of these goods and services.

9. Emergency Preparedness and Response

The EMS Program Team has established a subcommittee, the Emergency Response Subcommittee, which shall have as one of its members the DEQ's Safety Director and shall operate until replaced by a DEQ Program Team or other mechanism that conforms to the emergency preparedness and response requirements of ISO 14001.

Each year, in the month of October, the Emergency Response Subcommittee shall 1) develop an inventory of DEQ's emergency and accident exposures, 2) determine which of these emergency and accident exposures are significant, and 3) establish emergency and accident risk management objectives and targets for the upcoming fiscal year. In establishing its objectives and targets, the Emergency Response subcommittee shall pay particular attention to preventing and mitigating the environmental impacts associated with emergency and accident situations.

The Emergency Response Subcommittee shall review and revise the elements of the Emergency Preparedness and Response Plan based on its determination of which emergency and risk exposures are significant and following the occurrence of an accident or emergency situation.

The EMT shall periodically and where practicable, direct the test of such emergency response procedures.

Emergency Preparedness & Response

4.4.7

Section I

"Emergency Preparedness & Response" from NSF Guide

"Emergency Preparedness & Response" from NSF Metal Finishers Guide

"Emergency Response & Preparedness" from Colleges and Universities EMS Guide

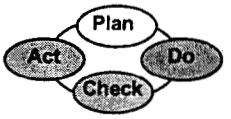
Section II

Charleston Public Works Emergency Preparedness & Disaster Recovery Procedure

Naval Aviation Depot North Island Emergency Response & Preparedness Procedure

Virginia Department of Environmental Quality Emergency Preparedness and Response Statement

Comments:



Emergency Preparedness and Response

Minimizing the impacts of uncontrolled events

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.



Don't think only about response – focus on how to prevent accidents in the first place

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.



Review prior accidents and incidents as one guide to where future incidents may occur.

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.

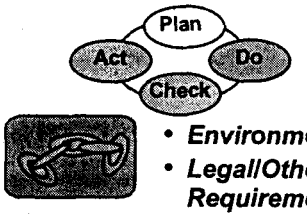
Getting Started:

- This 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. Look at what you have now and assess how well it satisfies the items discussed above.
- 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 (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.

USEFUL INFORMATION SOURCES:

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

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- ***Environmental Aspects***
- ***Legal/Other Requirements***
- ***Training & Awareness***
- ***Communication***
- ***Document Control***

- 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:

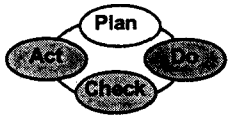
- **Mock drills** can be an excellent way to reinforce training and get feedback on the effectiveness of your plans / procedures.
- **Post copies** of the plan (or at least critical contact names and phone numbers) around the site and especially in areas where high hazards exist. Include phone numbers 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?

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Capture the Learning: Emergency Preparedness & Response Worksheet

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 ...	

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3.2 Emergency Preparedness and Response [ISO 4.4.7]

What the ISO Standard Requires

ISO 4.4.7 requires an organization to have and maintain procedures related to accidents and emergency situations, and to prevent and mitigate any environmental impacts that may be associated with these events. When an actual event occurs, the organization must review its emergency preparedness and response procedures and revise them as necessary. The organization must also test these procedures as practicable.

Starting Points

All of the facilities involved in this project had some existing documentation related to responding to emergency conditions, as required by existing environmental regulations. However, some room for improvement was noted in that they generally kept these plans "on the shelf," and did not have a way of making sure that appropriate procedures would actually be followed in the event of an emergency. In several cases, the plans had been essentially written by a consultant or drawn from boilerplate texts, and had not actually involved the facility in identifying specific potentials for accidents and emergency situations (for example, tank loading and unloading, shipping and receiving docks, inspection of pipelines). None of the facilities had performed tests of their procedures. In cases where there had been actual emergency events, none of the facilities had actually gone through the process of reviewing and considering revisions to their procedures. Several facilities failed to maintain the necessary emergency response supplies (absorbent materials, buckets, shovels, mops, personal protective equipment, etc.).

Implementation Tips

In general, the metal finishers had a good start on the plans and procedures required by regulations, but needed to follow through in several areas.

1) Review your emergency plan to be sure that it covers all of your identified significant aspects. Check especially "high risk" areas and activities. For example, does your plan adequately cover all tanks and storage areas, shipping and receiving areas, loading and unloading activities?

2) If you have had emergency situations in the past, did your procedure require you to investigate the causes and determine the adequacy of your response? Did you make the necessary revisions to your procedure and re-train your personnel as necessary? All of these follow-up activities determine whether or not you have a sound EMS that allows you to learn from your past mistakes so that you can avoid them in the future.

3) Be sure that you have incorporated your emergency preparedness and response procedures into your day-to-day activities and operational procedures as necessary. For example, you may need to write specific procedures to cover: periodic checks of tank levels to spot potential leakage conditions, on-going maintenance of tank couplings, pipelines, pumps, and valves, and for making sure that emergency response supplies and equipment are maintained.

Examples

Generally, the Emergency Preparedness and Response Procedures developed by the metal finishers served two purposes:

1) It served as a reference document to existing emergency response programs and plans. In one case, a company referred to their existing Emergency Response Program Manual, and in another, to a "Preparedness, Prevention, and Contingency Plan" approved by a state regulatory agency.

2) It identified the scope, the responsibility for maintaining the procedure, and for implementing it.

> EMS Group: Responsible for the implementation and maintenance of the procedure.
>
> Environmental Health and Safety Director: Responsible for coordinating and maintaining this procedure on a day to day basis.

Conformance Check

The emergency preparedness and response element of the ISO 14001 Standard is an area where metal finishers should be able to build on their existing emergency response plans.

Emergency plans developed for regulatory compliance (e.g., Resource Conservation and Recovery Act, and Spill Prevention Control and Countermeasures) should address part of the requirements of this

section but not necessarily all. Two requirements of the standard are often overlooked: developing and maintaining procedures to 1) identify the potential for accidents and emergency situations, and 2) prevent and mitigate impacts. Check your emergency response plan to be sure these requirements are incorporated.

Testing of emergency response procedures may not always be practical (e.g., of equipment may be damaged or employee safety may be compromised) and is not required by the standard ("test such procedures where practicable").

EMS Links

- Environmental aspects: The environmental aspects you have identified represent your most important interactions with the environment. Review your aspects when identifying potential emergency scenarios. Environmental aspects should be reviewed after an emergency response incident.

- Structure and responsibility; Training: The emergency response procedures you develop must be communicated to employees. Employees must also be aware of their roles and responsibilities regarding emergency response.

- Operational control: Simply revising your response plan may not prevent an emergency, mitigate an environmental impact once it has occurred, or prevent reoccurrence of an emergency. Review your operational controls to check for changes that would support emergency preparedness and response efforts.

ELEMENT 3.5

EMERGENCY RESPONSE AND PREPAREDNESS

Nearly all C/Us have experienced an event that required some kind of emergency response and most have suffered numerous events both large and small. Unfortunate events such as an employee injury, a spill of hazardous chemicals, or a fire do occasionally occur. With C/Us typically using a wide variety and quantity of hazardous chemicals, and having a wide range of faculty, students, and staff using those chemicals, the potential for accidents is high. As a result, C/Us must be particularly vigilant in planning and preparing for emergencies. Emergency planning can limit injuries; protect faculty, students, staff, neighbors and the environment; reduce asset losses; and minimize damage to the C/Us image.

Helpful Documents for Gauging Emergency Risk and Making Preparations

- Site maps to determine relative locations of hazardous chemicals/wastes/operations to people and environmentally sensitive areas
- Drainage plans, including surface and subsurface conveyances
- Past records and reports of emergencies and any rectifying actions taken

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

- Assessing the potential for accidents and emergencies
- Preventing incidents and their associated environmental impacts
- Responding to incidents, and
- Mitigating impacts associated with these incidents

Often, the most difficult part of developing emergency preparedness and response plans is identifying the potential for accidents and emergencies. The EMS Manager should form a team composed of C/U personnel (and outside consultants or regulators if necessary or beneficial) to examine all facility activities. Extend your evaluation beyond those materials and operations that are obviously or inherently dangerous; ask "what if" questions under both normal and abnormal conditions.

Implementation:

Procedure 3.5, Emergency Response and Preparedness, describes the personnel responsible for completing emergency preparations and incident reviews, and how and when the tasks will be completed. There are many overlapping requirements in local, state and federal regulations concerning emergency response and preparedness.

Overlapping Emergency Response Requirements

Various federal programs require some sort of emergency response plan:

- RCRA
- SPCC
- EPCRA
- Oil Pollution Act of 1990
- Hazard Communications
- 40 CFR 1910.120

No tool is provided for this element because the tools and forms associated with emergency response and preparedness are already included as part of the documents required by federal, state, and local regulations.

EPA's Integrated Contingency Plan

U.S. EPA has attempted to address many of the federally required topics by producing a guidance document for an "Integrated Contingency Plan" covering oil and nonradiological hazardous materials. The guidance can be accessed at the EPA website: http://www.epa.gov/swercepp/er-docs.htm - top

SAMPLE PROCEDURE ONLY – REVISE AS NEEDED

[C/U Name]	EMS Procedure	3.5
	Effective Date	
	Subject	**Emergency Response and Preparedness**

Purpose This procedure is used to anticipate, document, prepare for, and review preparedness plans and emergency events.

Step 1 The EMS Manager and other EMS Participants selected by the EMS Manager are responsible for identifying dangers, taking proactive steps to prevent emergency incidents, and completing tasks in preparation for emergencies.

Step 2 The EMS Manager will prepare and update an Emergency Response Plan that contains all emergency procedures required by local, state and federal regulatory agencies.

Step 3 The EMS Manager will familiarize and train appropriate faculty, students, staff, - and emergency coordinators on the procedures described in the Emergency Response Plan.

Step 4 For each emergency incident, the EMS Manager and the emergency coordinators will determine the cause of the emergency, evaluate the response to the incident, and identify actions to be taken to minimize its recurrence.

Step 4 At least twice per year, the EMS Manager and other EMS Participants will review the Emergency Response Plan and any emergency incidents that occurred since the last review.

Step 5 Documentation concerning emergency response and preparedness and emergency incidents will be retained at the facility for at least 5 years.

Responsible Person: _____

Signature and Date: _____

CPW ENVIRONMENTAL MANAGEMENT SYSTEM PROCEDURE

The on-line version and secured hardcopy are the controlled documents. The secured hardcopy will be identified by an "Official Document" stamp giving date of distribution. Any and all other documents are uncontrolled. Contact the EMS Program Manager for revision level status

Effective Date:	**October 1, 2000**	**Page 1 of 7**
Revision: 2	**Identification Number: EMS – 4. 4. 7**	
Title:	**Emergency Preparedness & Disaster Recovery Procedure**	
Prepared By:	**EMS Procedures Subcommittee**	
Reviewed By:	**EMS Management Steering Committee**	
Approved By:	**William E. Koopman Jr., General Manager** **John Cook PE, Assistant General Manager**	
Date Approved:	**August 25, 2000**	

0.0 Requirement: ISO 14001, Sub Clause 4.4.7 Emergency Preparedness/Response

1.0 Purpose

To minimize disaster impacts and return CPW back into operation in a safe, quick, cost effective and environmentally sensitive way.

2.0 Scope

ISO 14001, sub clause 4.4.7, applies to the need to identify, prevent, and respond to emergencies and the period of time following the emergency event.

3.0 Responsibility & Authority

3.1 Executive management is responsible for ensuring that an emergency preparedness program is implemented and for approving the emergency preparedness plans.

3.2 Section heads and department heads are responsible for plan development, plan implementation and emergency preparedness team selection.

3.3 Emergency Preparedness Team(s) (response/disaster recovery) are responsible for dealing with immediate threats to associates, the public and the environment and assisting in returning CPW back to functional operation

4.0 Procedure

4.1 Up-front Activities

4.1.1 The department head/section head will initiate the process to prepare a disaster response/recovery plan. The department head will assemble the Emergency Response/Disaster Recovery Team(s).

After review and approval of the plan(s), the team(s) will test the plan as conditions allow and, communicate the plan to associates and document. At least annually, or in the event of a disaster, review the plan and recommend plan modifications as necessary.

4.1.2 Duties of the Department Head/Facility Manager
The duties of the department or facility manager include the following aspects:

a) Identify potential risks to facilities and processes;
b) Identify and implement Best Management Practices (BMP's) where necessary (i.e., Process Safety Management, Risk Management, Hurricane Preparedness, etc.);
c) Establish incident reporting procedures;
d) Maintain, testing and inspection equipment according to specified frequency and procedures;
e) Establish emergency preparedness training for facility personnel;
f) Review new and significantly modified equipment or processes for modification of emergency response plans as necessary;
g) Manage emergency response change to new or modified equipment or processes;
h) Review at least annually, facility procedures for release prevention and emergency response;
i) Review and update hazard assessments at least every five years or as a result of changes;
j) Audit compliance of prevention programs at least every three years as required by the EPA Risk Management Plan and OSHA's Process Safety Management Standard.

4.1.3 Identification/Impact Assessment of Facility Resources
The department head or facility manager will inventory critical operations and available resources to identify and assess potential risk in the event the facility is destroyed in part or in total. This inventory should identify what critical items may need to be quickly replaced. The inventory should include, a description of required personnel skills, necessary chemicals or equipment, and identification of vendor sources.

4.1.4 Impact Minimization Strategies
An impact minimization strategy will be prepared for the identified resources that are critical and have a high likelihood of being impacted or destroyed. For example, this may include special training, backup files, backup communications or operations at other locations, additional containment around some chemicals and wastes, temporary containment (sandbagging) around critical equipment, bracing, and fire suppression equipment.

4.1.5 Phone Numbers and Contacts
There should be documented emergency numbers in both the emergency plan and disaster recovery plan. As a minimum the following should be included:

a) department head, section head, or facility manager
b) relevant civil defense contacts, (fire, police, toxic release contacts, FEMA, etc)
c) executive management
d) safety manager

4.1.6 Routine Inspections
The department's status, resources and supplies in terms of disaster recovery should be inspected frequently. As resources or facilities change, preparedness and recovery plans should be updated.

4.1.7 Off-site Disaster Headquarters
The affected department head, with input from the section head and/or executive management, will establish a working headquarters and necessary communication links.

4.1.8 Production and environmental control equipment will be appropriately maintained with preventive maintenance controls.

4.1.9 Critical Data
Regulatory records, account data, etc. should be backed up and stored in a protected environment. Software systems, such as, Supervisory Control and Data Acquisition (SCADA) essential to production will be backed up with the ability to function at other locations. Paper type files, which are critical to the operation should be copied and filed at a backup location or stored electronically or on microfiche, in a fire-resistant location.

4.1.10 Supplies
Some supplies should be purchased before a disaster, for the health and safety of the associates. Supplies should include such items as food, water, bedding, flashlights, tools, first aid kits, etc. for at least a three-day period.

4.1.11 Environmental Protection Supplies
Environmental protection supplies, such as spill cleanup materials, personal protection equipment, over-pack drums, etc. and materials required in regulatory plans such as the Risk Management Plan (RMP) will be maintained.

4.1.12 Emergency Plan Training and Distribution
It is important to prepare and distribute emergency plans to essential associates before a disaster occurs. Training on emergency response and disaster recovery will be given and documented to team members and associates involved in work that may cause significant environmental impact.

4.2 Disaster Control

4.2.1 During and Immediately Following a Disaster
After the immediate crisis is under control, the following activities should occur. These steps are considered as recovery actions.

4.2.2 Convene the Emergency Response Team/Disaster Recovery Team

The ERT/Disaster Recovery Team will transition into a disaster recovery team (DRT). Additional members will/may be added at this time and include management, operations, safety, purchasing and finance members.

4.2.3 Area Inspections
The DRT will do an initial audit for safety hazards and, if any are found, notify associates to stay out of the affected area until corrected. Additional inspections would be made to assess facility or equipment operability and preliminary cost estimates on financial damage.

4.2.4 Associate Needs
After assessing immediate safety needs, longer-term needs should be considered. This may include information to families or help in locating families. This may include additional supplies such as food, water, blankets, and temporary shelter for associates, etc.

4.2.5 Insurance Companies/Relief Agencies
Proper insurance representatives/federal agencies should be called to schedule site visits as soon as possible.

4.2.6 Human Resource Skills Bank
Associates who are able to report to work should report to an identified individual or location so that recovery needs can be matched with associate skills and assigned appropriate recovery tasks.

4.2.7 Reestablish Process Control and Utilities
During the disaster some utilities may have shut down by accident or design. The DRT will work with the water and wastewater departments and with the gas and electric companies to restore service.

4.2.8 Reestablish Communications
CPW personnel will need to be directed during communication outages. Telephone company personnel may be needed to reestablish critical phone lines. It may be necessary to use cellular phones and radios for initial communications. Once communications are reestablished, a call-center should be set up to respond to associate and public questions and concerns.

4.2.9 Facility Repairs
Start work in restoring damaged facilities, based upon critical need.

4.2.10 Reassess and verify that chemical and waste systems are working and not causing adverse environmental impacts. If a potential problem is noted, it should be checked out, and if necessary, immediately corrected.

4.2.11 Reestablish SCADA and Computer Systems
Some operations are totally dependent upon computer systems. These must be repaired or relocated as quickly as possible. Computer systems that support customer services should be reestablished as quickly as possible.

4.2.12 Replacement of Critical Files
Any essential files that may have been destroyed should be re-created by off-site or back-up files. This is especially important concerning certain customer or associate personnel files.

4.2.13 Reestablish Financial and Human Resources System
It may be necessary to shift certain financial and HR systems, such as compensation and benefit administration to another site for a period of time.

4.2.14 Media
Contacts from, or to the media, should be directed by CPW executive management or an authorized designee.

4.3 Post Incident Investigation

4.3.1 In the event of an emergency situation or accident that has significantly impacted the environment or which has the potential to do the same, a post incident investigation will be conducted. An emergency situation or accident requiring a post incident review is one in which there is the potential to be a major violation of a regulatory permit, a major impact to public health or services, or a major impact to the environment. The need for a post incident investigation shall be determined by executive management or the appropriate department head and a post incident review team shall be assembled accordingly to conduct the investigation. Such post incident investigations shall evaluate the cause(s) of the incident and identify factors which should be evaluated for preventing or mitigating the impacts of future incidents, including revising its emergency preparedness and response procedures and documenting the results.

4.3.2 Corrective Action Plan
The affected department shall prepare a corrective action plan (if necessary) and submit the plan and subsequent plan amendments to the Post Incident Review Team for review and approval. The EMS program manager (or designee) shall track the activities of the corrective action plan and perform verification surveillance(s) upon completion of corrective action plan activities and submit recommendation(s) for closure to the Post Incident Review Team.

4.4 Related Documents and Data

4.4.1 Emergency Response Plans
4.4.1 Inventory of Damaged Facilities
4.4.2 Spill Report Records.
4.4.3 Injury Report Records
4.4.4 Emergency Response and Disaster Recovery Team records
4.4.5 FEMA, Damage Survey Report Forms
4.4.6 Post Incident Review Report
4.4.7 Corrective Action Plan

Naval Aviation Depot, CA

ISO 14001 Procedure

Title	Document Effectivity	Status
Emergency Response and Preparedness	First Issue Date 01/22/1999 Revision Date	Issued
EMS Procedure No	**EMSMR**	Rev
EMSP447	Melito M Barrera/NI/NADEP	1

Purpose

To identify the potential for accidents and emergency situations, and to prevent and mitigate the EIs that may be associated with them.

Scope

This procedure covers credible potential accidents occurring at NADEP, North Island facilities which may result in EIs to the land, water or air.

Responsible Party	Responsibilities
EPO	• Prepares, tests, and updates ER&P plans. • Trains personnel in ER&P as required. • Reports to the EMS MR on assessments, tests and investigations. • Assigns roles and responsibilities for ER&P (see EMSP 441).
EMS MR	• Coordinates with the OUMRs to identify SEAs and SEIs associated with potential accidents or emergency situations.
OUMR	• Identifies SEAs and SEIs associated with potential accidents or emergency situations.
NAVOSH	• Reviews and approves health and safety aspects of ER&P plans. • Supports the EPO in preparation and testing of ER&P plans.

PROCEDURE

1. <u>The EPO and NAVOSH will:</u>

a. Maintain ER&P plans, identify and access regulations (see EMSP 432), and train personnel on ER&P (see EMSP 442).

b. Conduct tests of ER&P programs to check the procedures established in the ER&P plans during each EMS cycle (see EMSP 46). At the conclusion of each test, the drill will be evaluated and recommended improvements incorporated into the ER&P plans. The EMS MR will be advised in writing of any planned tests and the results of the tests.

c. Review and revise ER&P programs and plans where necessary after each occurrence of an accident or emergency situation.

d. An emergency situation falls into the category that would trigger the notification process after meeting the conditions referenced in

the NADEP Emergency Environmental Event Notification Chart. Minor spills are excluded.

2. The EMS MR and the OUMR will:

a. Identify SEAs and SEIs associated with potential accidents or emergency situations identified in ER&P plans (see EMSP 431).

References

ISO 14001:1996, Section 4.4.7

EMSP 431 Identification of Significant Environmental Aspects

EMSP 432 Legal and Other Requirements

EMSP 441 Structure and Responsibility

EMSP 442 Training, Awareness and Competency

EMSP 453 Record Management System

EMSP 46 Management Review

NADEP California Business Plan

NADEP Spill Prevention, Control and Countermeasures Plan

NADEP Central Berm Contingency Plan

NADEP Risk Management Plan

NAVAVNDEPOTINST 5090.1B

NADEP Emergency Environmental Event Notification Chart

Document Edited By:
Form Rev 1.0.2 15 APR 2000

exhibits, and minutes of management reviews. All EMS records shall be permanently maintained unless and until Virginia's record retention policy establishes a lesser requirement.

8. Operational Controls

8.1. Operational Controls over Significant Impact Activities and Operations

Concurrent with its determination in February of each year as to which of DEQ's environmental aspects are potentially significant environmental impacts, the EMS Program Team shall identify the operations and activities associated with these potentially significant environmental impacts and direct the manager of the operation or activity involved to establish and maintain operational controls to avoid the occurrence of a significant environmental impact, deviations from the Environmental Policy, or failure to achieve environmental objectives and targets. The operational control opportunities identified shall become a part of the Environmental Objectives and Targets for the upcoming year.

8.2. Operational Controls for Goods and Services Used by DEQ

Concurrent with its determination in February of each year as to which of DEQ's environmental aspects are potentially significant environmental impacts, the EMS Program Team shall 1) review the goods and services used by DEQ and supplied by others and 2) determine the potential significant environmental impacts associated with these goods and services. The EMS Manager shall communicate relevant procedures and requirements to the suppliers and contractors of these goods and services in order to reduce the adverse environmental impacts of these goods and services.

9. Emergency Preparedness and Response

The EMS Program Team has established a subcommittee, the Emergency Response Subcommittee, which shall have as one of its members the DEQ's Safety Director and shall operate until replaced by a DEQ Program Team or other mechanism that conforms to the emergency preparedness and response requirements of ISO 14001.

Each year, in the month of October, the Emergency Response Subcommittee shall 1) develop an inventory of DEQ's emergency and accident exposures, 2) determine which of these emergency and accident exposures are significant, and 3) establish emergency and accident risk management objectives and targets for the upcoming fiscal year. In establishing its objectives and targets, the Emergency Response subcommittee shall pay particular attention to preventing and mitigating the environmental impacts associated with emergency and accident situations.

The Emergency Response Subcommittee shall review and revise the elements of the Emergency Preparedness and Response Plan based on its determination of which emergency and risk exposures are significant and following the occurrence of an accident or emergency situation.

The EMT shall periodically and where practicable, direct the test of such emergency response procedures.