NATIONAL CENTER FOR ENVIRONMENTAL DECISION-MAKING RESEARCH

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ISO 14001 Guidance Manual

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Tennessee Valley Authority
University of Tennessee

Strategic Environmental Management

Continual Improvement

YOUR ORGANIZATION ISO 14001 Guidance Manual

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About the Author

Raymond Martin heads the Environmental Management System Development program for a major corporation. Dr. Martin brings with him fifteen years of experience in the areas of environmental engineering, chemical manufacturing, regulatory compliance, operations and business management, and law. He has been senior design engineer and senior site safety and health officer on numerous UMTRA and Superfund sites, as well as many RCRA sites in the private sector. Dr. Martin received his doctorate in environmental engineering, with a focus on environmental management system development and implementation, and is completing his MBA. He is actively involved in developing ISO 14001 EMS programs for many of the world's largest service and manufacturing organizations including Toyota, Con Edison, Philips Electronics and many more. Dr. Martin has developed and implemented landmark EPA model programs in project design, and has taught practices and procedures at the University of Arizona College of Law.

Dr. Martin is a member of the American Society for Testing and Materials (ASTM) Technical Advisory Group to ISO. As such, he has participated in the development of the ISO 14000 EMS standards. He is also the ISO 14000 Technical Director for the Certification Board of NQA, one of the world's largest ISO Registrars. His in-depth knowledge as a result of these professional relationships makes him one of the premier program developers and auditors in the industry.

Dr. Martin has published extensively on ISO 14000 and many other environmental management issues in books and professional journals, focusing on systems design, implementation and decision-making criteria. That exposure allowed him to be selected by the National Center for Environmental Decision-making Research to write this ISO 14000 Guidance Manual.

Dr. Martin has recently given presentations on ISO 14001 and other environmental management issues at the World Environmental Congress, the University of Tennessee, Oak Ridge National Laboratory, the Environmental Auditing Roundtable, and MIT's Technology and Policy Program. Dr. Martin was selected to develop a survey and chair a conference concerning EPA's Self Policing Policy where EPA, in an historic move, requested input from the private sector on the direction of their implementation of the Policy.

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Introduction

Purpose and Use of This Manual

This manual has been developed and organized to assist all interested organizations in the development of an Environmental Management System (EMS) that is consistent with the ISO 14001 Standard, achieves EMS Registration, and improves the overall environmental performance of the organization. Because each organization is different, NCEDR has tried to create a document that is specific enough to give the tools needed to set up and implement an EMS, but general enough to allow the flexibility for addressing unique characteristics.

The various sections of the manual describe each element of the ISO 14001 standard and provide step-by-step procedures, sample documents or templates, and tips for developing and implementing an EMS that is appropriate to the organization and its operations. Please remember that this is a guidance document and not a rigid instruction manual. All of the ISO elements must be addressed in your program and meet the ISO requirements, but you will notice there is much flexibility allowed in meeting the requirements. There are some procedures that should be followed “to the letter”. These procedures should be self evident, but for your convenience, each one of these pertinent procedures will be identified appropriately.

Who Should Read This Manual

Internal EMS program developers should use this manual. It is designed to supply guidance regarding the intent of an ISO 14001 EMS. The form and procedural contents of the EMS are very specific, and any attempt to generalize those items would lead to an EMS that will not effectively “fit” the organization.

If the basic form the EMS should have is questioned, your organization may need support to effectively generate and implement an EMS. Please utilize this document as tool and a resource in developing your EMS, but seek expert advice as necessary. The development of an ISO 14001 EMS is a complex and critical process.

Tailor-Made Solutions

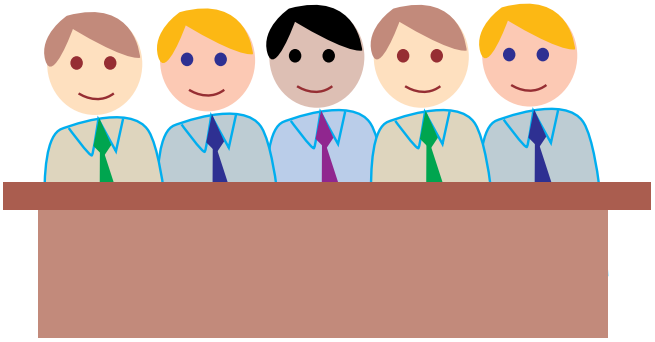
External Assistance

External Consultant

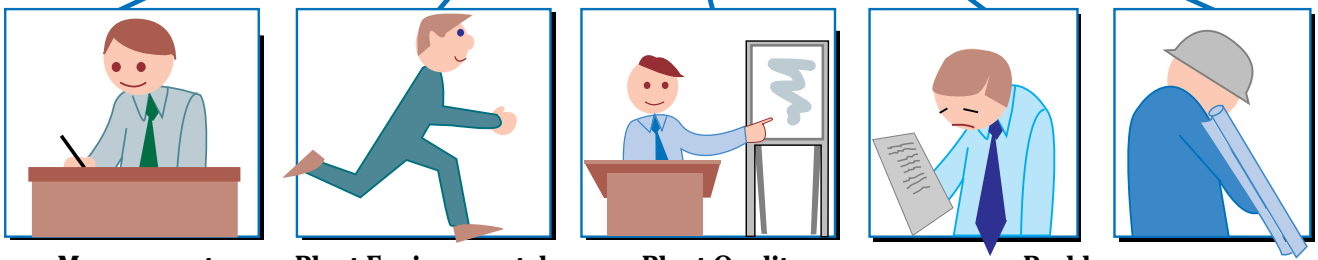
- Guideline Reviews
- Checklists
- Helpdesk

Internal Solution

PLANT ACTION TEAM



- Information Records
- Priorities
- Action Plan



Management Representative

Plant Environmental Coordinator

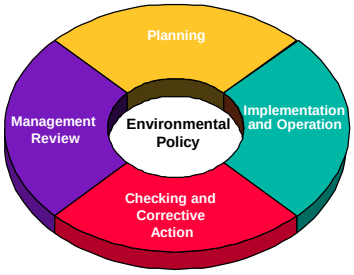
Plant Quality Manager

Problem Owners

Organization of this Manual

Most environmental management systems are built on the "Plan, Do, Check, Act" model. In the ISO 14001 EMS Standard, these steps have been expanded to encompass seventeen elements. These seventeen elements are grouped into five phases that are similar to "plan, do, check, act". The phases are called Environmental Policy, Planning, Implementation and Operation, Checking and Corrective Action, and Management Review.

This manual is organized in the same manner as the ISO 14001 program elements. For each element of ISO 14001 you will find the text of the actual ISO 14001 standard, step-by-step procedures, tips for developing and implementing the EMS; and sample documents or templates that can be used as is or customized to the organization.



The diagram at left will be used throughout this manual to help you identify the phase being discussed. Look for the highlighted phase at the top of each page.

ISO 14001 Overview

Following is an outline of the ISO 14001 EMS Standard:

Scope

Normative references

Definitions

Environmental Management System Requirements

- General Requirements
- Environmental Policy
- Planning
  - Environmental aspects
  - Legal and other requirements
  - Objectives and targets
  - Environmental management program(s)
- Implementation and Operation

- Structure and responsibility
- Training, awareness and competence
- Communication
- Environmental management system documentation
- Document control
- Operational control
- Emergency preparedness and response

Checking and corrective action

- Monitoring and measurement
- Nonconformance and corrective and preventive action
- Records
- Environmental management system audit

Management Review

Program Intent

The intent of an ISO 14001 environmental management system (EMS) is to develop a systematic management approach to the environmental concerns of the organization. The expected outcome of this approach is c*ontinual improvement* in environmental management.

By setting an environmental **policy**, then making the environmental concerns of the firm clear (Aspects) and defining what will be done to control them (Objectives and Targets), **planning** is accomplished. Then, by establishing organizational structure, personnel responsibilities, competency and training, **implementation begins**. Communication practices, documentation control and procedural documents, operational control and emergency preparedness define the **operation** portion of the program. These items are usually included in an EMS Manual, which documents a program to accomplish the Objectives and Targets set above. The organization's methods for measuring and monitoring its environmental impacts is also included in the Manual, along with practices for identifying nonconformance and for implementing corrective and preventive actions. These, along with routine systems audits and record keeping constitute the EMS **checking and corrective action** program. And finally, the program has a routine **management review** of its activities. The words in bold above describe the general sections of an ISO 14001 EMS.

Integration with Existing procedures

Much of what an organization must do in an ISO 14001 EMS is probably already being done. No organization can operate without some environmental programs in place. These programs may need modification to comply with the ISO 14001 standard, but they serve as a good starting point to begin construction of an ISO compliant EMS. In fact, a good way to look at your EMS Manual is to view it as a road map. It will tell people where to find programs the organization uses to handle environmental concerns such as: wastewater systems operational manuals, air permit operating requirements, hazardous wastes handling procedures, materials purchasing requirements, and so forth.

A well-conceived ISO 14001 EMS will use existing environmental programs and procedures as a foundation. It will also include the business management practices of the company wherever possible. An example of this would be tying environmental impacts of raw materials purchases into an existing procedure to review raw materials specifications for engineering requirements and consistency. Many firms already have such procedures in place.

Other types of program integration may include integrating cost accounting practices with environmental operational practices. Many organizations cannot actually determine where their environmental dollars go. As a result, they cannot identify opportunities for financial improvement in environmental practices. Without such information, the environmental management of an organization is difficult. If management cannot see any cost benefit in environmental decision making, the managers usually take the least costly option. Activity-based costing allows a more comprehensive understanding of how environmental expenses are accrued by process and product rather than by facility or region. Then process control and product design can be reviewed to see if costs associated with their environmental impacts can be minimized. This is a good example of what ISO 14001 hopes to accomplish--good financial management leading to better environmental control.

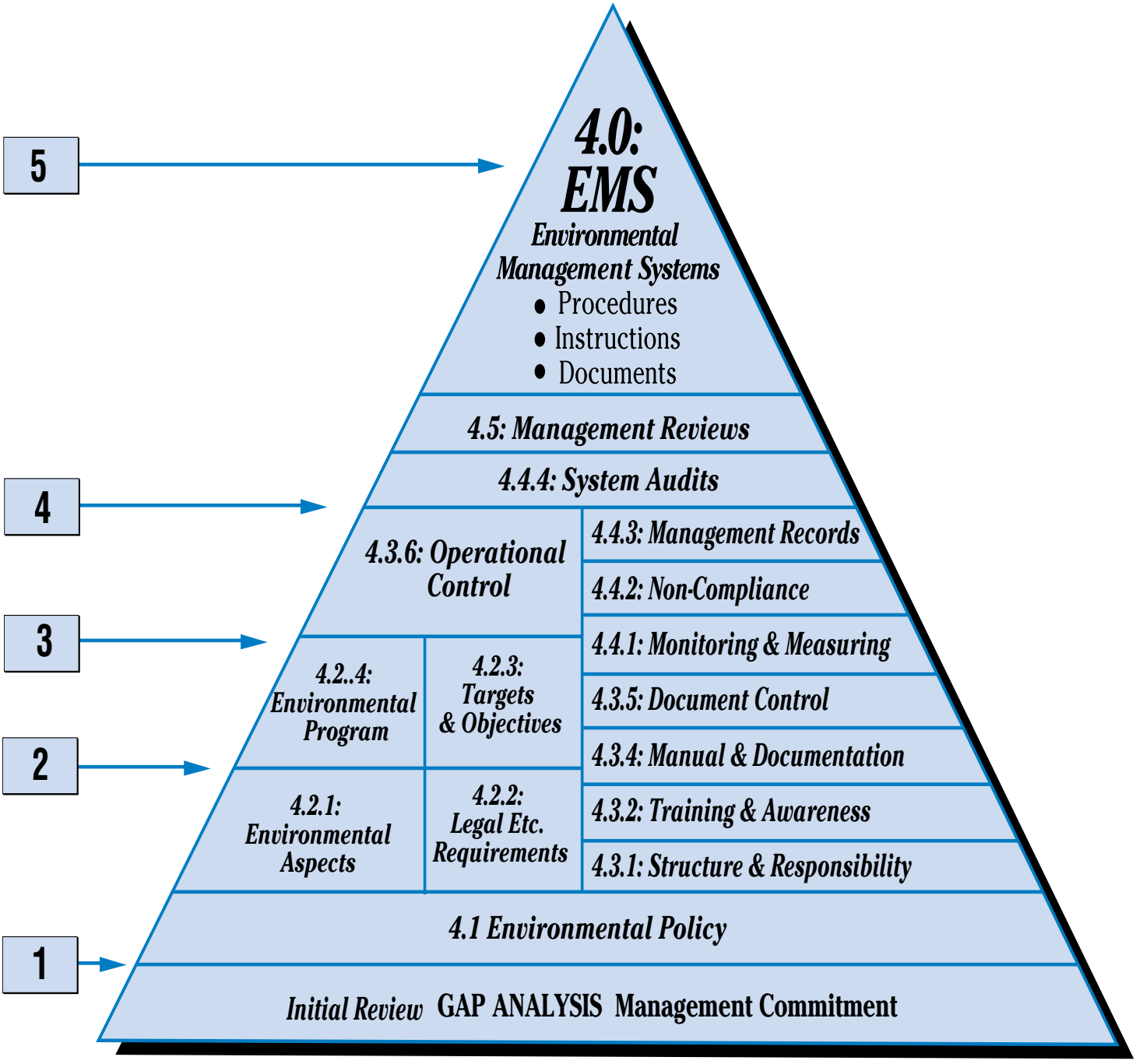
What Part of Your Operation is Covered?

Many facilities have multiple operating units at one location. It is not uncommon to have a research and development office at a production facility. The production facility may want to achieve ISO 14001 conformance, but not the R&D offices. As long as an auditor can clearly see the separation of these two activities, both physically and administratively, there should be little cause for concern.

The example above can be used to illustrate another point. If a large manufacturing facility had an R&D office on-site, there might be two distinct functional units that share physical resources but are separate cost centers. In some cases, units will actually pay each other for office space, utilities and janitorial service although they are part of the same corporation. In this case, separation for purposes of ISO 14001 program development and implementation is not difficult. Activities should be separate enough, however, to be clear to an outsider. If R&D engineers are constantly venturing out onto the production line and making changes in practices and procedures, it may appear to an auditor that they are a portion of the operational group for the facility. Separation of functional groups might be harder to argue.

An example of separation that may NOT be acceptable is separation of the purchasing function from the rest of an operation. Since purchasing is tied at almost every management level in an operation, this would seem unreasonable to most auditors, and could generate a concern in evaluating an ISO 14001 EMS program.

The EMS-Pyramid-



How to use this Manual

This Guidance Manual is designed for the development of an ISO 14001 environmental management system. The outline of the Manual is in the order that it should be used. The introduction and scope should be read first. Sections are designed to follow the actual ISO 14001 Standard in layout. The process begins with an Initial review (not required by the standard, but essential for program development) and then embraces Policy, Aspects, Objectives and Targets, etc…in the order they appear in ISO 14001.

Each section has the same format:

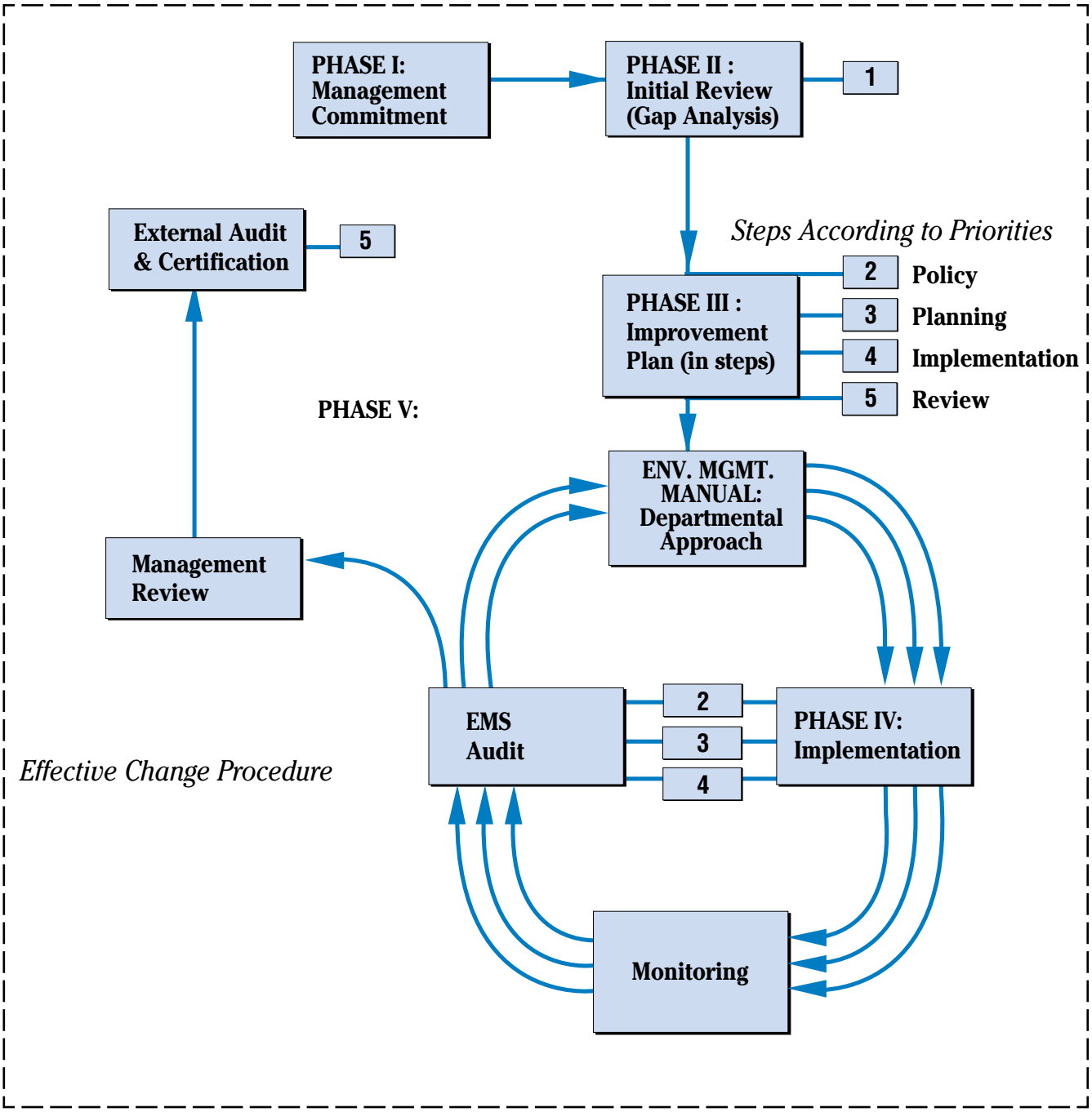
- The subclause of the ISO 14001 Standard is quoted word for word. This should be reviewed to make sure the user understands Standard expectations.
- Definition: This section describes what the subclause of ISO really means.
- Purpose: This section describes what the subclause of ISO hopes to achieve in the program.
- Procedure: This section describes how you should build your program to comply with the subclause, what things you should consider, and how you will integrate the procedures into what you already do.
- Tips: Tips are just that…tips on things you should think about in reference to this section and reminders about what types of line items need to be included in the procedure and documentation.

This manual has been written by experienced ISO 14001 program developers. Take the time to read an entire section, and then think it over before you write. It is recommended that you read a section over one day, and spend some time thinking about before writing the next. For some sections, such as operational control, it may take many days to generate the documents and implement the practices. You may want to review the Manual section on operational control every few days during that phase to remind yourself of what you are trying to accomplish.

Reminder: This is a complex process. Once you have gone through the exercise of defining your environmental aspects and impacts and how you will manage them, you will recognize opportunities not visible previously, and be able to modify practices to better fit the overall context of your operation. By rushing through the developmental process, you will have missed these opportunities which are the core of ISO 14001. Make sure you spend time thinking about each section before proceeding.

Project Course:-

Environmental Management System



Initial Review or Gap Analysis

Description and Purpose

A fundamental concept of the ISO 14001 EMS Standard is continual improvement of environmental performance. Before you can plan for improvement, you must first determine the current state of the organization's environmental programs.

The initial review or gap analysis is, in itself, a microcosm of a well-organized approach to the entire ISO 14001 EMS development process. Each specification of the standard must be reviewed, including policy, legal requirements, training, objectives and targets, operational control systems, document control, auditing, management review, and corrective action.

The review should take into account the culture, products, marketing strategies, and other specifics of the organization. In all cases, consideration should be given to the full range of operating conditions, including possible incidents and emergency situations that may be encountered.

The ability of suppliers and subcontractors to comply with the Organization’s EMS program and applicable regulatory requirements should also be evaluated. It is strongly recommended that the initial review consider energy use, financial accounting, and information systems so that these issues may be integrated into the EMS program.

Procedure

To effectively begin the Initial Review, several things must happen. First, Management should issue a company-wide announcement of intent and endorsement. This should include estimates of the time required to complete the Initial Review, and time required to complete the entire project. Second, the project leader should be identified and vested with ample authority for completion of the project.

The Initial Review is a review of all pertinent documents, from which an accurate plan is designed for the EMS Gap Analysis. All information from the review, including deviation from regulatory requirements and adverse impacts on the environment, should be identified along with policies, programs, procedures, training and work instructions, and

operational controls.

A portion of the project team should begin to assemble a registry of appropriate regulations identified during the Initial Review. All pertinent national, state, local and self-subscribed requirements should be assembled. They should be compared with identified environmental impacts.

An Initial Review is also important in ensuring that EMS design is compatible with all current organizational management structures and operations wherever possible. This is especially important where the EMS interfaces with the site's existing health and safety, accounting, computer systems, purchasing, energy utilization and other management programs. The focus will be to achieve operational efficiencies that ensure environmental improvements and maximize cost reductions. Initial Review outputs will be:

- An EMS Gap Analysis Design that details where existing environmental management procedures must be further investigated to determine conformance with the Standard.

- A review of the site's overall environmental management strengths/weaknesses.

- A schedule of events for the Gap Analysis.

Gap Analysis

The gap analysis allows for a quick but comprehensive assessment of the facility's existing environmental management practices and procedures, and compares them with the requirements of the Standard. To perform the Gap Analysis, a standard template tailored for that specific purpose is used. The template is a questionnaire with a three way scoring system, which develops a final rating of the current programs of the site as they compare with the sections of the Standard. The score from this questionnaire and investigative template identifies which areas of the EMS might be enhanced to improve environmental performance and comply with the Standard.

Based on the results of the Gap Analysis, the project schedule

and design may require modifications. Modification should precede further systems development. Using the results of the Gap Analysis, the EMS developmental process can now begin. This may involve modifying existing procedures, adapting other business procedures such as those designed for health and safety, accounting, or risk management to environmental utilization. At certain points, new procedures will be required.

Prior to embarking on EMS development, always remember that the more flexible your EMS is, the easier it will be to implement and the more flexible it will be in the future.

Tips

➢ The following can be sources of valuable information:

- Equipment manufacturers
- Suppliers and vendors such as waste disposal companies
- Government agencies
- Databases
- Community/Civic groups
- Environmental advocacy groups

Remember to evaluate current performance against relevant internal criteria, such as organization practices and guidelines in addition to external standards and regulations.

Consider benchmarking against other organizations or industry associations.

Environmental Policy Development

ISO 14001 4.2 Environmental Policy

"Top management shall define the organization's environmental policy and ensure that it:

a) is appropriate to the nature, scale and environmental impacts of its activities, products or services;

b) includes a commitment to continual improvement and prevention of pollution;

c) includes a commitment to comply with relevant environmental legislation and regulations, and with other requirements to which the organization subscribes;

d) provides the framework for setting and reviewing environmental objectives and targets;

e) is documented, implemented and maintained and communicated to all employees;

f) *is available to the public."*

Description

The establishment of an Environmental Policy mandated by top management, and verified by them during Management Review, is the first requirement of the Standard. The Policy sets the tone for the establishment of EMS principles. The Policy directs corporate goals, corporate responsibilities, and the establishment of corporate performance milestones against which the management system must be judged. Top management is held responsible for the initiation of Policy and for providing direction for others who may be tasked with the development of the final Policy itself. The Policy should account for the following:

- Reflect the moral and ethical basis for the organization's actions.
- Account for regulatory/self-imposed requirements.

Remember To:

- Consider all significant products/services and activities in Policy determination.
- Develop a Policy in writing.
- Effectively communicate the Policy.
- Include wording covering three key areas:
  - compliance with laws and regulations;
  - pollution prevention;
  - continual improvement.

- Stress commitment to continual improvement.
- Provide coordination to other organizational policies.
- Provide attachments to requirements, internal and external.
- Be germane to the operation's products and services as they impact the environment.
- Be clear, concise, and implemented at all levels of operations.
- Be publicly available.
- Strive toward prevention of and continual reduction of adverse environmental effects, thus supporting sustainable development.
- Set and allow for publication of environmental objectives and targets, improvement plans and management reviews.
- Satisfy the requirements of concerned third parties such as insurance companies, banks, shareholders, etc…
- Be updated and checked routinely.

Purpose

The Environmental Policy sets the stage for all of the other elements of the Organization's Environmental Management System (EMS). The policy establishes goals for environmental performance against which the effectiveness of the management system will be judged. It should provide a unifying vision for the organization. Because the policy statement can have a significant impact on the Organization's image, it should be clear and verifiable.

Procedure

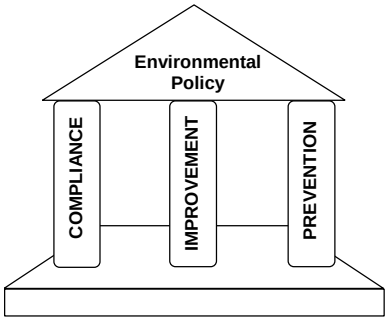
1) Top management is responsible for setting environmental policy. The policy must meet the requirements of ISO 14001 4.2 as stated above

2) Everyone in the organization should understand the environmental policy and what is expected of them in order to achieve the objectives and targets established later on.

Tips

- Make the policy simple.
- The policy should relate to the products and services offered by the organization. The gap analysis may offer help in defining policy by ensuring the policy reflects all aspects identified.
- In addition to top management, involving other parts of the organization in policy development will help to build ownership and support.
- Policy may be integrated into other documents such as a health and safety manual, a quality manual, etc…
- Explain, communicate, and verify that employees understand the firm's environmental policy.
- Offer the environmental policy for review externally.

More Policy Tips



- Consider addressing the following issues in the policy:
  - Sustainable development and/or product life cycle thinking.
  - Minimization of adverse environmental impacts from new developments by integrating environmental management practices and procedures in the design phase.
  - Minimization of pollution, waste, and resource consumption at all levels in the organization, and commitment to recovery, recycling, and reuse.
  - Sharing of environmental expertise with others.
  - Encouragement of EMS practices in suppliers/contractors.
- Routinely review the policy and update it as necessary.

Environmental Aspects

ISO 14001 4.3.1 Environmental Aspects

"The organization shall establish and maintain (a) procedure(s) to identify the environmental aspects of its activities, products, or services that it can control and over which it can be expected to have an influence, in order to determine those which have or can have significant impacts on the environment. The organization shall ensure that the aspects related to these significant impacts are considered in setting its environmental objectives.

The organization shall keep this information up-to-date."

Description

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."

Environmental **aspects** are those elements of an organization's activities, products, services or physical resources which *may* have potentially beneficial or harmful effects on the environment. These may include discharges and emissions, raw materials and energy use, waste recycling, noise, dust, and visual pollution.

An environmental **impact** is the change that takes place from the occurrence of any given *aspect*. The relationship between the two is causal: an impact is the pollution that would result if an environmental aspect were not properly managed or controlled.

Aspects include technical concerns such as potential process, storage, transfer, transportation, utilities, and product impacts. Impacts include emissions to air, water, hazardous waste, soil and groundwater, energy use, material use, cosmetic and nuisance concerns. Aspects are reviewed at the level of the site, plant, department, installation and process. Complaints from third parties should be included in the development of a list of aspects.

Some of the aspects will not be regulatory requirements. As an example, waste production and energy consumption, although not regulated by set reductions or targets by government, are still aspects.

There are two kinds of aspects: those that are a direct result of facility operations, and those that are indirect results of facility operations. An example of the two:

Direct Aspect: Raw material use in car manufacture, such as steel use.

Indirect Aspects: Raw material production by a supplier, such as mining and smelting in the production of the steel a plant uses. Since a firm has some influence over suppliers with the power of its purchases, these are aspects that should be thought about. Note that you DO NOT have to set any measurable performance targets or objectives for the operations of your suppliers or subcontractors. But think about them.

Aspects can be identified in four easy steps:

1. Activities are first reviewed in process increments small enough to be examined for impacts, but large enough to get the job done in a reasonable time.

2. All environmental aspects of the procedures or process are identified.

3. All potential and actual environmental impacts from these aspects: positive impacts, negative impacts and potential impacts, are identified and associated with an aspect.

4. The aspects are judged for their significance. A measurement system is developed to separate those aspects which are Significant (and thus will require “Targets and Objectives” and “Operational Control” under the ISO 14001 Standard) and those that are not. Since a Registrar auditor must review the procedures for this step, it is suggested that it be written down and quantified.

Purpose

Aspects identification is important, since it is from this identification of the potential to impact the environment that the rest of the system is built. Remember that direct aspects include those that are clearly evident to the facility, like hazardous waste generation, air emissions, waster discharges, etc. *Indirect* aspects include the activities of raw materials suppliers and end-users not directly related to the organization, but in some manner under their control. By identifying these various aspects, they can then be properly managed. This is the basic intent of the entire ISO 14000 process, so good identification of your aspects is essential.

To ease in implementation of an EMS initially, indirect aspects such as the impacts from suppliers may be identified but relegated to the status of general Objectives rather than specific Targets until the system matures. This will be addressed in a later chapter.

Factors to Consider:

- ecological effects
- human health impacts
- catastrophic effects
- resource depletion
- scale, severity & duration of impacts
- probability of occurrence
- cost of changing
- other business effects

Identification of aspects is a continual process under any EMS system. The aspects identification process includes all past, present and future impacts that an organization's activities have had, are having, and will have on the environment. Included in this process, aside from the identification of regulatory requirements, should be an effort to identify the potential legal, financial, and business risks associated with all activities. By beginning to identify the other business concerns associated with your aspects, they will become easier to manage and the EMS will begin to integrate itself into other management systems.

Procedure to Identify Aspects

Questions to ask to assess and list Aspects, both direct and indirect, are detailed in the following steps:

1. How do the organization's activities, products and services impact the environment?

2. Are these impacts adverse?

3. Are procedures in place for the identification and control

of adverse environmental impacts for new or altered products and services?

4. Is the facility in a location where there are special environmental concerns that must be addressed?

5. Will any severe injurious environmental impacts occur in the event of a process failure or human error?

6. What is the likelihood of such an emergency situation?

7. How will the firm rate their *significant* environmental aspects while considering impacts, likelihood, severity and potential frequency?

8. What would be the scope of the identified environmental impacts?

Aspects evaluation should include all phases of operations from the design phase to R&D, marketing, outsourcing, purchasing, production, hazardous waste and solid waste management, product packaging, distribution, sales and utilization of the finished product. Disposal by the end-user could also be considered.

Aspects Tips

- Be sure to include environmental impacts NOT governed by regulations in the determination of aspects. The legal requirements for compliance are a good start, but not the whole picture. Also look at resource depletion, energy use, visual impacts, etc…

Once environmental Aspects have been determined, and those that are Significant have been identified, then the Objectives and Targets can be outlined. Some of the Aspects may be given general Objectives of indeterminate duration due to time, technology, or financial constraints. These simple business decisions should be a portion of the aspect determination process. You may want to document this decision process and its results.

Keep in mind that some aspects will be POSITIVE. Remember to list them as well, since you might want to communicate them to third parties as a portion of the ISO 14001 EMS

Communication under Section 4.4.3 of the standard.

Look at the services used and supplied by the firm as well as products manufactured. Off-site servicing of equipment is a potential aspect; the actions of subcontractors and suppliers are as well.

Take special care to ensure that the delineation of Significant Aspects can be defended. Just make sure that the mechanism for making that determination is clear, well documented, and produces results that are sensible. As an example, if a company did not identify that a fleet of 100 heavy highway trucks traveling through a small and scenic hamlet in vacation country was an aspect, let alone a Significant one, this may be unacceptable.

The determination of Aspects, and the declaration of those that are Significant, is the basis on which the rest of EMS development rests.

Environmental Aspects:-Things to Consider

Requirements	*Technical*	*Environmental*	*Level*
customers	process	air	site/plant
legislation	storage	water	department
permits	transfer	waste	installation/ equipment
banks/insurance	transport	soil and groundwater	
complaints	utilities	energy consumption	subcontractor/ supplier
corporate, and Policy guidelines	product	nuisance	
		external safety	
		product	

Legal and Other Requirements

ISO 14001 4.3.2 Legal and Other Requirements

"The organization shall establish and maintain a procedure to identify and have access to legal and other requirements to which the organization subscribes, that are applicable to the environmental aspects of its activities, products or services."

Description

A procedure to identify legal requirements of the organization should be established and maintained. This includes all laws and other self-imposed requirements to which the organization adheres. These requirements can be partially established by reviewing the previously completed aspects and impacts. Considerations here include asking how the organization identifies, tracks and accesses legal requirements? How are changes in these requirements tracked? How are employees and others, such as subcontractors and suppliers, informed of any changes in legal requirements?

Purpose

The purpose of identifying and maintaining access to legal requirements is self-evident: If one doesn't know what laws are applicable, how can one be sure if the facility is in compliance or not?

Setting the Legal Framework for Your EMS

Also, it is important to identify other self-imposed requirements that the organization follows. These may include items such as management system performance criteria, client-supplied requirements, insurance company requirements, lending institution requirements and other such internal and external requirements not demanded by law.

The purpose of identifying these items is to ensure that all operations take into account not only the law, but also the other self-imposed and non-legal practices. Many legal and contractual violations are a direct result of lack of awareness generated by lack of knowledge.

Tips

- The organization should include all requirements pertinent to its aspects and impacts in the development of its Legal and Other Requirements list, including:
  - Site specific requirements such as operating permits (CAAA Title V).
  - Product/service-based requirements (TSCA, etc.)
  - Industry specific requirements (Responsible Care, QS 9000, etc.)
  - All applicable environmental laws (40 CFR 261 et seq.).
  - Any other requirements based in authorizations, agreements, contracts, and permits (environmental indemnification, etc.).
- The process of identifying, registering, and evaluating legislative, regulatory, and policy requirements pertinent to the environmental aspects of operations begins with the initial review. In the review, all legislative requirements should be identified. Maintenance of these requirements is achieved by staying current with any legislative and regulatory changes.

Objectives and targets

ISO 14001 4.3.3

"The organization shall establish and maintain documented environmental objectives and targets, at each relevant function and level within the organization.

When establishing and reviewing its objectives, an organization shall consider the 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 objectives and targets shall be consistent with the environmental policy, including the commitment to prevention of pollution."

Description

Objectives and Targets are where you shift from identifying your environmental aspects and impacts to developing a plan to improve them. Objectives and targets are established to meet the goals of the organization's environmental Policy. Objectives and targets are developed from the results of environmental Aspects development. They must be developed within the scope of the environmental Policy, and should quantify the organization's commitment to environmental improvement with time. They must, since the firm operates in a closed economic system, consider the financial, operational and business limitations of the organization.

Typically, environmental Objectives are overriding considerations such as the development of better employee education and training, improved communication with other interested parties, EMS development and registration. Environmental Targets are traditionally specific items like the reduction of energy utilization 10% in a year, or the reduction in hazardous waste generation 3% over three years. Targets are more closely related to measurable events and might be directly identified as cost reducing. Objectives are more philosophical and general.

Objectives and Targets:

Are they documented at relevant functions and levels in the organization?

Are they consistent with the Policy, and do they have the three commitments required in the Policy (go back and check!)

Are they consistent with the business plan?

Can you track and monitor them?

Purpose

Apart from beginning to identify environmental Objectives and Targets, an initial review should also begin to identify environmental opportunities for the firm. In fact, the structure of the initial review should include this as one of its primary objectives. To that end, Objectives and Targets should be set where improvements will be most likely to reduce risks to the organization and the environment, reduce liabilities, and are rationalized by a cost benefit analysis.

When setting the Targets and Objectives, the organization should consider the establishment of measurable environmental performance indicators that can be subsequently used as the basis for an environmental performance evaluation system which will provide information to management about the functioning of the ISO 14001 EMS. This will be an excellent basis for a "Management Review", when coupled with audit reports and financial performance data. To effectively determine actual performance under such a system, environmental Targets should be established with specific time constraints and measurable performance parameters.

Procedure

Objectives are set to establish overall, and often long-term, concerns of the organization about their environmental performance. Numerous objectives may be set which may or may not have specific; measurable targets associated with each of them. For any non-significant aspects identified earlier, just an overall, long-term objective may be established.

An Objective may be to see all suppliers and subcontractors develop their own EMS. This Objective could be supported by a simple statement that:

1. the organization recognizes its financial "control" over suppliers, but feels that they cannot abuse that control by demanding their suppliers develop an EMS

2. the organization will therefore merely request that their suppliers consider developing an EMS of their own.

In this way, the ISO 14001 view (see Annex "A", of ISO 14001)

that financial control does actually amount to “control” under the Standard, is addressed without making any demands. The big difference is that the firm is asking suppliers to consider an EMS, not telling them.

For each significant aspect identified, the organization may set an objective as well as a measurable target associated with that objective, with perhaps some operational control associated with it.

Example:

An objective of the organization may be to have their processes reduce raw materials consumption and energy use.

A target associated with that objective could be set by the organization by stating that they will reduce electrical consumption by 8% over the next three years in specific processes. As you can see, the target is measurable, but the objective doesn’t have to be.

Targets and Objectives may include some or all of the following concerns:

- Reduction of waste generation,
- Resource depletion,
- Pollution prevention,
- Environmental product design parameters,
- Environmental impacts of suppliers and subcontractors activities.

Some performance indicators that firms use in their Targets and Objectives include:

1. Quantities of raw materials/energy per unit production
2. Quantity of emissions/releases/wastes overall and per unit of production

3. Number of environmental incidents/violations

4. Quantity of recycled materials used in packaging and production

5. Potential for the recycling of the firm's products

6. Vehicular use per unit of production

7. Environmental operational costs per unit production/ per violation or incident

8. Environmental restoration projects or other positive environmental programs

Another consideration is that targets should be set at several levels of the firm. For example, purchasing might set a target to buy 75% of all paper products from recyclable sources. Janitorial services may hope to reduce the use of solvent based cleaning products by 25% over a year. The Board of Directors might hope to establish a program where all suppliers and subcontractors are certified to an EMS Standard by the end of this century.

Most operational Targets should be identified at the department level, by the department managers, and be included within the framework of the annual budgetary/planning process already in place at virtually every corporation worldwide. Department managers may wish to get assistance from the Management Representative (MR) for this task, like seeking assistance from the Comptroller for development of budgetary figures.

An evaluation and modification of environmental Objectives and Targets is carried out annually by an update of the environmental aspects. Objectives and Targets should be reviewed as a portion of departmental performance reviews. The results of these reviews should be included in the information supplied to management for the Management Review required in any EMS program. Decisions should be made concerning the scope and intent of the original targets and objectives, as well as the performance indicators about

how the targets and objectives were met.

Tips

- Operational staff best sets objectives and targets. Since they will be ultimately responsible for performance, they should be included in the decision-making process when developing Objectives and Targets.
- Objectives should be consistent with the Policy. The Pollution Prevention, Compliance, and Continual Improvement philosophy of the Policy should drive them.
- Make Objectives flexible. Make a statement of the results desired, and allow staff members to define the “How” portion wherever possible.
- Make Objectives simple, at first. Then build on them.
- Make Objectives understood to all members of the organization.
- Make realistic Objectives and Targets.

REMINDER: Don’t forget the opportunities existing for your suppliers and subcontractors to assist you in conformance to the Standard.

Practical Help

Internal Performance Criteria

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 materials management
- waste management
- water management (e.g., waste, storm, ground)
- air quality management
- energy management
- transportation

Environmental management program(s)

ISO 14001 4.3.4

"The organization shall establish and maintain (a) programme(s) and procedures for periodic environmental management systems audits to be carried out, in order to

- *determine whether or not the environmental management system*

    1. *conforms to planned arrangements for environmental management including the requirements of this International Standard; and*

    2. *has been properly implemented and maintained; and*

- *provide information on the results of audits to management.*

The organization's audit programme, including any schedule, shall be based on the environmental importance of the activity concerned and the results of previous audits. In order to be comprehensive, the audit procedures shall cover the audit scope, frequency and methodologies, as well as the responsibilities and requirements for conducting audits and reporting results."

Description

What is the EMP?

An action plan about how the organization will meet the Objectives and Targets of the EMS.

Lists responsibilities, methods, and time frames for completion.

Incorporates environmental issues into the greater business management arena.

Is communicated and tracked internally.

Up to now, this guide has focused on laying the foundations that the EMS will be developed on, and identifying the Targets and Objectives of the EMS. To ensure that these Targets and Objectives are accomplished, an Environmental Management Program (EMP) is designed.

Once the organization establishes its environmental Objectives and Targets, then planning begins to develop a Program for achieving them. This Program should be integrated into the existing environmental management practices at the organization wherever possible, and should be tied into the strategic plan of the organization as well. Issues such as scheduling, resource allocation, and responsibilities should be included in the Program to allow for the successful

achievement of the Objectives and Targets.

Purpose

The Program develops specific, prioritized actions dealing with processes, products, services, projects, and facilities that relate to already established environmental Significant Aspects, Objectives and Targets. The EMP should always reflect the organization's environmental Policy. The actions must be included in the documentation of the Program so that crucial operational practices and responsibilities are reviewed, revised, and redeployed regularly.

Procedure

The Environmental Management Program should be integrated with existing organizational structures such as financial management, purchasing, legal, operational, and management information systems. It is essential that environmental management have equal representation at the business management level relative to other groups within the organization. This would include input into issues such as access to capital, choices in technology, production procedures, employee training, and emergency protocols.

There will be instances where existing management structures are not adequate to achieve the Targets and Objectives set for the EMS. In that case, new structures must be developed. These new structures are best developed with input from those responsible for the function area in question, such as the department head or foreman of a process. The Management Representative, EMS developmental expert and other operational staff members for the practice being considered may be included in this structural development.

Projects may be initiated as a result of EMP developmental activities that invest in new products, processes, and equipment. These would be expected where the investments are aimed at the reduction of environmental effects, either direct or indirect, to allow for a higher level of performance, or for cost reduction. Again, this would have been investigated and identified during the Initial Review, and set as Targets.

Environmental Management Program (EMP) monitoring is primarily the responsibility of the department manager for each specific activity. They should routinely report to senior

management the status of any and all environmental programs and projects under their control. This will allow integration of environmental issues into the scope of management concerns at the senior level.

The EMP does not need to be contained in one document. A “road map” to other documents will fully comply with the Standard. Just keep in mind that those documents must include the roles and responsibilities, processes and schedules that the Standard requires of the EMP. The EMP should be integrated into other business planning wherever opportunities present themselves and appear to be economically or strategically beneficial to the organization.

Tips

- Utilize employee input wherever possible.
- Communicate the expectations of the EMS and EMP, along with the responsibilities to those individuals who can affect environmental aspects.
- Construct the EMP based on current programs and management structures wherever possible, assuming that existing programs are sound and financially efficient.
- Include health and safety programs if so desired.
- Continually reevaluate the organization's action plans when changes occur in procedures or facilities.
- Keep the EMP simple.
- By coordinating the EMP with other management programs, cost savings can be effected.

Structure and responsibility

Structure and Responsibility

"Roles, responsibilities and authorities shall be defined, documented and communicated in order to facilitate effective environmental management.

Management shall provide resources essential to the implementation and control of the environmental management system. Resources shall include human resources and specialized skills, technology and financial resources.

The organization's top management shall appoint (a) specific management representative(s) who, irrespective of other responsibilities, shall have defined roles, responsibilities and authority for

a) ensuring that environmental management system requirements are established, implemented and maintained in accordance with this international standard;

b) reporting on the performance of the environmental management system to top management for review as a basis for improvement of the environmental management system."

Description

For an EMS to be effective, individual roles and responsibilities must clearly be defined as they relate to the achievement of environmental Objectives and Targets, and the overall operation of the EMS. Top management must supply the necessary resources, both financial and staff, to ensure that the EMS is effectively implemented. They are also responsible for appointing a Management Representative (MR) to oversee the operation of the EMS.

Organizational structure should be defined in writing. An **organizational chart** will be helpful for illustrating many of the environmental responsibilities that must be addressed.

Responsibilities

- ✓ ***Are they defined for environmental management?***
- ✓ ***Are the roles communicated?***
- ✓ ***Are adequate resources allocated?***
- ✓ ***Is a management representative appointed?***
- ✓ ***Do the roles integrate EMS into other business management functions where practicable?***

Specifically, key personnel should be clearly identified in the organizational structure such as:

- Management Representative (MR)
- Director EH&S (or that person responsible for executive decisions of an environmental nature)
- Facilities Manager
- Plant Environmental Coordinator (EC)
- Purchasing Agent(s)
- Production Manager(s)
- R&D Manager

Purpose

All employees of the organization should clearly understand their environmental roles and responsibilities, as well as understand the importance of the environmental Targets and Objectives that they can affect. Top management defines and documents the responsibilities, authorities and interrelationships of all key environmental personnel. The key roles that effect environmental performance should be included in the employee's job description where possible, and are included in that employee's performance evaluation.

The key roles and responsibilities may be documented by Human Resources in a consistent format that includes the person's name, title, organizational responsibilities, date of the document, key environmental tasks, authority, and interrelation with other key task personnel. This document will be useful for internal communication, training, and documentation later in the EMS development process.

Procedure

Organization employees should develop a draft version of their personal environmental responsibilities and tasks, and these should be compared with management's views to see if there

are differences. Identified weaknesses should be corrected. This is also a good chance to review individual perspectives of the current management structure and organizational responsibilities. Many times, improvements of a procedural or structural nature can be gained through this process.

Practical Help

Accountability and Responsibility

To ensure effective development and implementation of an EMS, it is necessary to assign appropriate responsibilities and authorities.-It should be recognized that companies and institutions have different organizational structures, and need to understand and define environmental responsibilities based up on their own work processes.

Environmental Responsibilities	Person(s)-Responsible
Establish Overall Direction	President, CEO, Board of Directors
Develop Environmental Policy	President, Chief Executive Officer, Chief Environment Manager
Develop Environmental Objectives Targets and Programs	Relevant Managers
Monitor Overall EMS Performance	Chief Environmental Manager, Environmental Committee
Assure Regulatory Compliance (Eternal)	Senior Operating Manager
Ensure EMS Compliance (Internal)	All Managers, Chief Environment Manager
Ensure Continual Improvement	All Managers
Identify Customers Expectations	Sales and Marketing Staff
Identify Suppliers Expectations	Purchasers, Buyers
Develop and Maintain Accounting Procedures	Finance/Accounting Managers
Comply with Defined Procedures	All Staff

The Management Representative (MR)

The Management Representative is one of the essential elements of a successful program. As such, the roles and responsibilities of this position should receive special consideration. The MR is essential for the homogeneity of the implementation process and for the continual improvement of the system once it has been established. The MR should be a member of the facilities management team. They should have overall responsibility for compliance with the requirements of the EMS, and should be charged with ensuring that changes in regulations and the firm's environmental effects are monitored and the system modified to meet them.

In larger operations (>5000 employees), one single person may not effectively handle the task of MR. So, the appointment of Environmental Assistants (EA) at the department level may be considered. Support for an EA includes adequate training as well as the allocation of adequate time to accomplish assigned EMS tasks apart from the EA's regular work schedule.

Staff Roles and Responsibilities

The specific responsibilities of the MR and EC do not absolve line management from compliance responsibilities for regulations and operational requirements of the EMS. For example, line managers may be delegated the responsibility to detail operating procedures which operations staff must follow.

A flow chart of roles and responsibilities may be used. This can simplify the process of structural review and re-thinking. As an additional tool, an environmental responsibility matrix could be included in the flow chart to effectively communicate the environmental responsibilities to all employees.

As the standard mentions in several places, structure and responsibility should be set up to involve all relevant functions and all levels throughout the organization. This section does not require a procedure but does require the following items for effective environmental management on a large scale.

Requirement	Action
1. Roles defined	Develop EMS organizational structure
2. Roles documented	Document organizational chart
3. Roles communicated	Route to all relevant employees
4. Responsibilities defined	Define all EMS position responsibilities
5. Responsibilities documented	Document utilizing spreadsheet or list
6. Responsibilities communicated	Route to all relevant employees

There is also a requirement on a smaller scale but for an important individual.

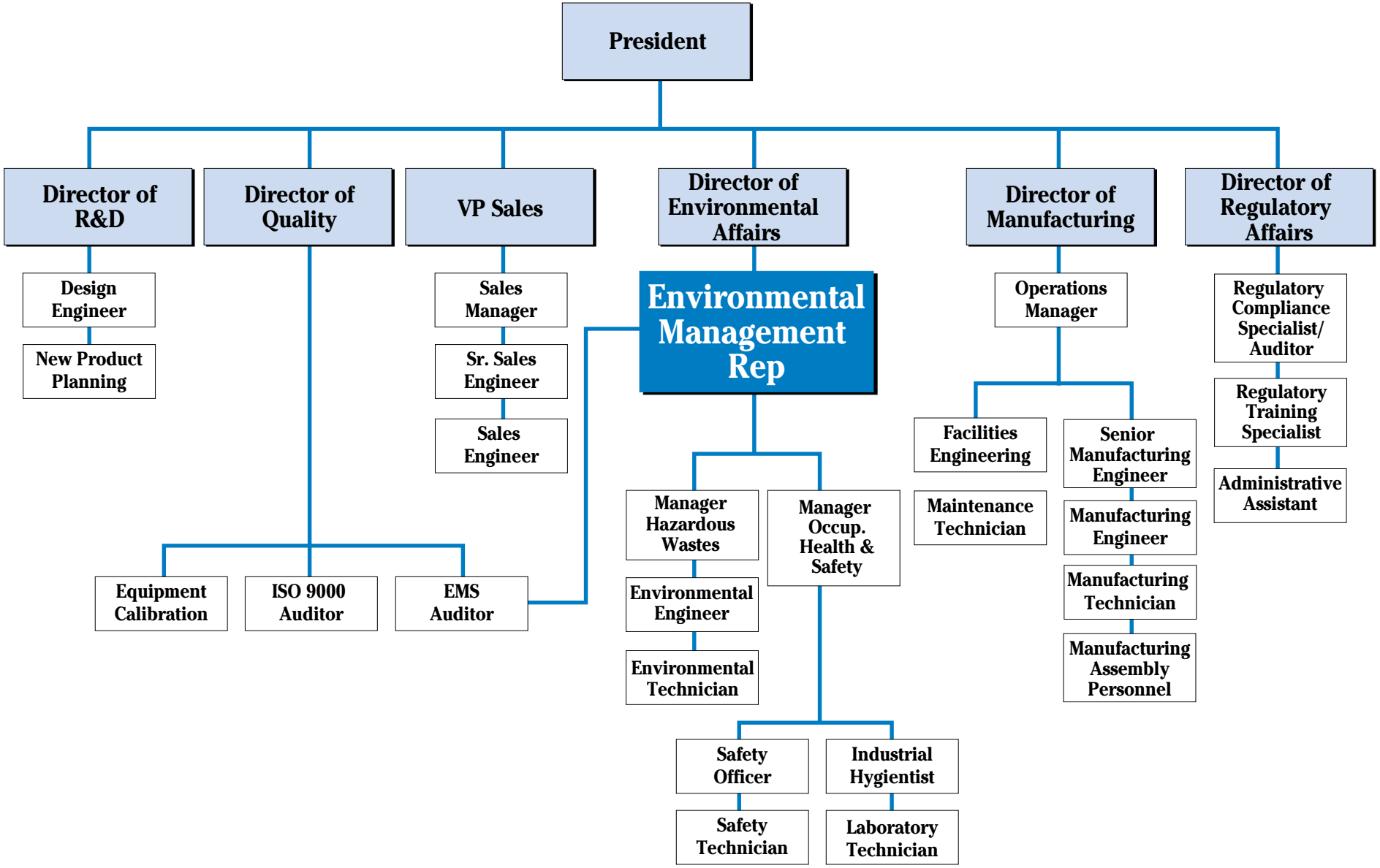
Requirement	Action
1. Top management appoints a specific MR	Steering committee appoints the candidate and documents decision
2. The MR must have their role, responsibility, and authority defined, documented, and communicated to:	
A. Ensure the EMS is established, implemented, and maintained	Develop separate document showing this individual's role, responsibility, and authority and route to all employees
B. Report on the performance of the EMS to Top Management every six months to evaluate performance and improvement areas.	Include the report schedule with Individual's and Top Management's Annual Plan

It is important that a **documented** performance report be developed and presented to Top Management prior to the certification audit.

Tips

- Make the structure as flexible as possible, while ensuring that it is comprehensive.
- Communicate the MR's roles and responsibilities to everyone in a clear and concise manner. Communicate roles and responsibilities **in writing** to individuals associated with significant aspects!

Environmental Functional Organization Chart



Training, awareness and competence

ISO 14001 4.4.2

"The organization shall identify training needs. It shall require that all personnel, whose work may create a significant impact on the environment, have received appropriate training.

It shall establish and maintain procedures to make its employees or members at each relevant function and level 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 specific operating procedures.

Personnel performing the tasks which can cause significant environmental impacts shall be competent on the basis of appropriate education, training and/or experience."

Description

When to Train:

- **New Employee Hire**
- **Change in Job Description**
- **Corrective Action notes failure to follow instructions**
- **New or Altered Procedures/Process**
- **Changed EMS Aspects/ Objectives/Targets**
- **New Regulations (local, state or federal)**
- **Unacceptable Job Performance**

Management has an essential role in developing organizational awareness and motivation by explaining environmental Policy and demonstrating commitment to it. This commitment of individuals and resources to the goals outlined in the environmental Policy, Targets and Objectives is the event that brings the EMS to life.

Training is important for two reasons:

1. *Employee action might have an impact on the environment.*
2. *Employees are a useful resource for generating ideas about establishing operational control for a process, defining environmental aspects, or defining structural responsibilities.*

Purpose

The basic intent of training is to explain the importance of the EMS to staff, and to explain their responsibilities for EMS operations. In order for responsibilities to be effectively understood, adequate training is essential. A training system should also include training for executives to ensure that they understand the EMS, know their responsibilities and have the knowledge to carry those responsibilities out.

Procedure

Staff members are trained in their specific environmental responsibilities that are directly related to Significant Aspects, Targets and Objectives in the EMS. If they do not have significant roles, then they should receive awareness training on EMS content and purpose. New hires and re-assigned staff members are given appropriate training on the specific aspects of their new position, the equipment they will be expected to operate, its impacts on the environment and expected methods of operation.

Employees will need to be kept abreast of regulatory changes

that impact their job performance. Training modules for management and operations staff should be developed to ensure this continuing education. Where in-house training is not adequate, out-sourced training should be utilized. Subcontractors and others with any impact on the EMS should receive training consistent with their impact on the system.

The MR should be responsible for the establishment of training requirements of each operational unit within the facility, as well as investigating the possible sources for that training. Training should include communication of the following:

◊ Requirements of the system, the importance of regulatory compliance, and the importance of compliance with environmental policy.

◊ The potential negative environmental effects of the employee's work. The positive effects of improved performance on their part.

◊ Their responsibilities in achieving compliance with the policies, regulations and EMS requirements.

◊ Consequences of failure to comply with the above.

Training requirements should be more detailed for those individuals that are responsible for verification of environmental performance, either regulatory compliance verification or EMS conformance verification. These training requirements and records should be maintained as a portion of the documentation of the EMS. Apart from formal training sessions, other methods of training may be used:

- routine departmental meetings,
- existing safety meetings (more prevalent than specific environmental meetings),
- flyers, leaflets, bulletin board presentations,
- subscriptions to environmental magazines, legal newsletters, and other environmental literature,

- local, community, or state environmental conferences.

Tips

- *Don't start from scratch in training programs…there may already be a wealth of training given to employees for establishing environmental responsibilities. Investigate and use it. On-the-job instruction should be included, but clearly documented where required.*
- *Plan training around existing meetings as much as possible to save on additional expense.*
- *Include environmental responsibilities in new employee training and orientation.*
- *Seriously consider the training and qualifications requirements for the environmental management staff and trainers.*
- *Consider EMS skills during recruiting and new employee selection.*
- *Clearly establish competency for various key tasks. These competencies should clearly align themselves with significant environmental aspects.*
- *Asking employees how they perform certain tasks can assess competency. This could be integrated into the initial review/gap analysis section of the EMS development process, since it will be required for the establishment of operational control.*
- *Supplement competency with training aids wherever possible and practical.*

Practical Help

Training, Skills, Competency

Type of Training	Audience	Purpose
Raising awareness of the strategic importance of environmental management	Senior Management	To gain commitment and alignment of the organization's environmental policy.
Raising general environmental awareness	All Employees	To gain commitment to the environmental policy, objectives and targets and to instill a sense of individual responsibility
Skills Enhancement	Employees with environmental responsibilities	Improve performance in specific areas—operations, R&D, engineering
Compliance	Employees whose actions can affect compliance	Ensure regulatory and internal requirements for training are met.

Communication

ISO 14001 4.4.3

"With regard to its environmental aspects and environmental management system, the organization shall establish and maintain procedures for:

a) internal communication between the various levels and functions of the organization;

b) receiving, documenting and responding to relevant communication from external interested parties.

The organization shall consider processes for external communication on its significant environmental aspects and record its decision."

Description

Effective communications can help an organization motivate staff, tell them what actions they should be taking regarding the environment, verify roles and procedures, monitor environmental performance, and act to identify potential for improvement. Improvement opportunities are often an overlooked portion of internal communication. Employee suggestions are extremely effective in improving procedures and products. Communications require top-to-bottom flow of information as well as bottom-to-top.

Communication with external parties is also important for comprehensive management of a firm's environmental aspects. Often, through good external communications, problems with regulatory agencies and Non-Governmental Organizations (NGO's) can be avoided. Communication from these sources may help in setting Aspects, Objectives and Targets.

Purpose

Communication in an EMS includes the communication of internal and external environmental information to management, and the communication from management to others of their intentions regarding environmental impacts. Communication should include procedures for internal reporting as well as external reporting on environmental activities of the organization. This communication is designed to:

Consider communication strategies for:

- **neighbors**
- **community groups**
- **other interest groups**
- **local officials**
- **regulatory agencies**
- **emergency responders**

- Demonstrate management's commitment to the environment;
- Make others aware of the organization's environmental policy and commitment to environmental responsibility;
- Address concerns about the organization's environmental activities by external parties; and
- Announce the organization's strategic environmental management approach.
- Establish a line of communication that clearly defines emergency responsibilities.

Opening the Information Lines

Lines of communication are especially crucial when emergencies arise and concerned parties ask questions relating to environmental risk. The release of contradictory or confusing information will create an atmosphere of mistrust and fear. Communication should be clear enough to leave no room for misinterpretation. The intent of communication to outside interests is to avoid misinformation.

Procedure

Once the organization has implemented an EMS, then communication should extend from the initial corporate issuance of an environmental report to other, "softer" forms of communication such as open houses for interested parties, routine press releases concerning environmental activities, direct environmental performance reports to the press.

Consider the following in this effort:

- Are there processes established for receiving and responding to internal and external interested parties concerns relative to the environment?

- How is the organization's environmental policy and performance communicated (internal and external), and are the results of environmental audits and other self-critical analyses included in this communication?

- Will internal environmental communication be adequate to foster continual environmental improvement?

When communicating, there are many specific items that may be important to communicate:

- Environmental policy and corporate profile;

- Established targets and objectives;

- Measurable environmental performance evaluation such as waste reduction figures, recycling efforts, energy savings, etc;

- Identified environmental opportunities; and/or

- Independent verification of communicated results.

The facility top management, the MR or the facilities' public relations officer should be the only ones to release information to third parties about environmental matters. Be as open to third party inquiries as possible, acknowledge the existence of problems where they arise, communicate about them, and try to involve responsible third parties in the solution process. Direct and honest communication increases the knowledge and understanding of external parties and lays the foundation for mutual trust and acceptance. Environmental performance may still be closely scrutinized, but the external party may view from a factual position rather than an emotional one.

It is important to note that this section refers only to the communication that is related to the environmental aspects

and the environmental management system (EMS). To fulfill this element of the standard, both internal and external communication must be addressed. Internal communication is that communication within the organization or facility directly related to the environmental aspects or the EMS. The standard requires communication at all relevant levels and functions within the organization. External communication is communication between the organization and an interested party outside the facility (e.g. EPA, environmental organizations, adjacent facilities or residents). The following will be required to fulfill this element:

A. Procedures:

1. Procedure for Internal Communication on Environmental Matters

2. Procedure for External Communication on Environmental Matters

B. Records (Examples)

- Received Internal Environmental Communication documents
- Responses to Internal / External Environmental Communication documents
- Proof of Policy Communication
- Suggestions related to environmental issues
- EMS document distribution sign off sheets
- Emergency Response Communication record
- Internal / External audit reports

Scope:

All internal communication directly related to the Environmental Aspects and the Environmental Management System.

Objectives:

Establish and maintain communication to:

1. Raise awareness of the organization's environmental policy, objectives and targets, and environmental management system.

2. Receive, document, and respond to environmental questions, concerns and suggestions that come from employees.

Responsibilities:

It is the responsibility of environmental affairs to communicate environmental information to all effected and interested internal parties. It is also the responsibility of environmental affairs to receive, document and respond to all environmental questions, concerns and suggestions from employees.

Procedure:

Communication From Environmental Affairs to Facility Personnel

Environmental Affairs places a routing list on each environmental document relating to the EMS and sends a controlled copy and a receipt slip to the pre-designated individual or area.

The individual or area representative initials or signs the receipt slip and sends it back to Environmental Affairs.

Tips

- How proactive does the organization want to be in communicating their environmental activities? Use this answer to develop the degree of depth in the EMS communication systems.

- When explaining what an employee should do regarding environmental concerns, an explanation of **why** those activities are important should be included. This action helps to develop a sense of purpose regarding employee job activities, no matter how simple or complex they are.

- **Keep communication simple**.

Environmental Management System Documentation

ISO 14001 4.4.4

"The organization shall establish and maintain (a) programme(s) for achieving its objectives and targets. It shall include:

A. designation of responsibility for achieving objectives and targets at each relevant function and level of the organization;

B. the means and time frame by which they are to be achieved.

If a project relates to new developments and new or modified activities, products or services, programme(s) shall be amended where relevant to ensure that environmental management applies to such projects."

Description

Up to now, this guide has focused on laying the foundations the EMS will be developed on, and identifying the Targets and Objectives of the EMS. To ensure that these Targets and Objectives are accomplished, an Environmental Management Program (EMP) is designed.

Once the organization establishes its environmental Objectives and Targets, then planning begins to develop a Program for achieving them. This Program should be integrated into the existing environmental management practices at the organization wherever possible, and should be tied into the strategic plan of the organization as well. Issues such as scheduling, resource allocation, and responsibilities should be included in the Program to allow for the successful achievement of the Objectives and Targets.

Purpose

The Program develops specific actions, in order of priority, dealing with processes, products, services, projects, facilities that relate to the already established environmental Significant Aspects, Objectives and Targets. The EMP should always

reflect the organization's environmental Policy. The actions must be included in the documentation of the Program so that crucial operational practices and responsibilities are reviewed, revised, and redeployed regularly.

Procedure

The Environmental Management Program should be designed into the existing organizational structures such as financial management, purchasing, legal, operational, and management information systems structures. This is essential if environmental management is to become an integral portion of overall general business management.

There will be instances where existing management structures are not adequate to achieve the Targets and Objectives set for the EMS. In this instance, new organizational structures must be developed. These new structures are best developed with input from those responsible for the activities in question, such as the departmental head or foreman of a process. The Management Representative, EMS developmental expert and other operational staff members for the practice being considered might be included in this structural development.

Projects may be initiated as a result of EMP development that invest in new products, processes, and equipment. These would be expected where investments are aimed at the reduction of environmental impacts, either direct or indirect, higher level of performance, or cost reduction. Project targets may be set from efforts in investigation and identification during the Initial Review.

Environmental Management Program (EMP) monitoring is primarily the responsibility of the department manager. Managers should routinely report to senior management the status of any and all environmental programs and projects under their control. This communication effort allows integration of those environmental concerns into the scope of management concerns at a senior level.

The EMP does not need to be contained in one document. A "road map" to other documents fully complies with the Standard. Just keep in mind that documents must include the

roles and responsibilities, processes and schedules that the Standard requires of the EMP. The EMP should be integrated into other business planning as much as is practical.

Tips

- *Utilize employee input wherever possible.*
- *Communicate the expectations of the EMS and EMP, along with responsibilities to those individuals who need to know.*
- *Construct the EMP based on current programs and management structures wherever possible.*
- *Continually reevaluate the action plans when changes occur in procedures or facilities.*
- *Keep the EMP simple.*
- *By coordinating the EMP with other management programs, cost savings can be effected.*

Document control

ISO 14001 4.4.5

"The organization shall establish and maintain information, in paper and electronic form, to

a) describe the core elements of the management system and their interaction;

b) provide direction to related documentation."

Description

Documenting an EMS can be as simple or as complex as the organization decides. EMS documents can and should be integrated with other management documents wherever possible. Cross-references with health and safety manuals and quality manuals are examples of this. Existing Procedures manuals may have environmentally related information in them.

Operational processes and procedures should be defined, documented and updated, especially those that establish operational control over **significant** environmental aspects.

The single-manual approach generally does not work for **complete** EMS documentation. Rather, the EMS Manual is a road map to other associated documents. The EMS Manual should describe what the EMS consists of, where other related documents are located, and where records of performance can be found. It should be a "one-stop-shopping" outline of all other sources of EMS paperwork.

Purpose

Employees should have all relevant environmentally significant procedures and practices identified in a single source. An Environmental Manual should do this. Those who require its information should know the manual's location. The Manual is a directory to the location and utilization of other existing programs the organization devoted resources to developing.

Procedure

Documentation is not required for every procedure or work process. Worker experience, skill, qualifications, standard agency techniques, or manufacturer's operating instructions are all adequate alternatives. Also, flow charts or other non-textual forms of documentation may be more effective than the publication of a "book" of instructions. Documentation should be sufficient to define the facility EMS.

Suggested elements of document control:

- **issue/revision date**
- **effective date**
- **approval (i.e., signature)**
- **revision number**
- **document number (or other identifier)**
- **copy number**
- **cross-references**

While documenting the procedures required under the EMS, practices that add no value to the process may be identified. These can be eliminated. And by attempting inter-departmental and cross-disciplinary documentation, the possibility exists of identifying similar procedures between departments that can be combined. To effectively achieve this sort of streamlining, a cross-departmental team approach is best, coupled with an external third party. This interdisciplinary approach will weed out bottlenecks, redundancies, redundant reviews and reports.

Working instructions MUST be clear and concise. Each step in the instructions should be numbered, the procedures should be given sequentially, and language should be used that the end user will easily understand. Illustrations may be used where words are not clear.

Key Question:

Is everyone working with the same set of documents?

All required tools, supplies, safety equipment and team support should be explained at the beginning of the instructions for any task. Measures of performance for a task should be clearly delineated, and the responsibilities for verification made clear. Criteria for acceptance, non-conformity resolution, and corrective actions should also be clear.

Operational control

ISO 14001 4.4.6

"The organization shall identify those operations and activities associated with the identified significant environmental aspects in line with its policy, objectives and targets. The organization shall plan these activities, including maintenance, in order to ensure that they are carried out under specified conditions by

a) establishing and maintaining documented procedures to cover situations where their absence could lead to deviations from the environmental policy and the objectives and targets;

b) stipulating operating criteria in the procedures;

establishing and maintaining procedures related to the identifiable significant environmental aspects of goods and services used by the organization and communicating relevant procedures and requirements to suppliers and contractors."

Description

What to do:

Develop procedures (written) for controlling key activities and operations that are associated with Significant Aspects.

Ensure employees are trained on these procedures.

Ensure that these procedures cover all normal and abnormal operating conditions, including emergencies.

Operational control over all activities *significantly* affecting the environment is a requirement of the ISO 14001 Standard. To assure this, operating methods and procedures must be written down for these activities. This provides consistency when staff changes occur, and clearly identifies to staff members what their job responsibilities are.

Specific **documented** instructions must be developed for those activities where absence of instructions might result in a non-conformance or a high risk of environmental impact. In those cases, written instructions must clearly and succinctly provide operating procedures, performance verification criteria and any corrective activities required in the event of a non-conformance. Master lists should be developed to control the existence, location and ownership of each procedure. These master lists may become bridge documents for the development of "operational control" as indicated in the Standard.

Purpose

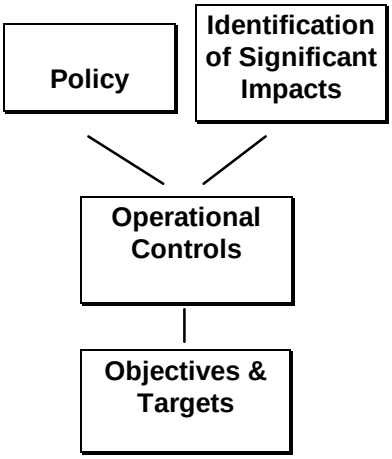
Implementation of the EMS begins with the establishment of Operational Controls to verify that an organization's Policy, Targets, and Objectives are achieved. Training, Procedures and Instructions are all-inclusive components of this Operational Control. Operational Controls can be of three basic types:

1. Those activities assigned to prevent pollution or conserve resources. Process re-engineering, capital project design, and new product development are a few examples.

2. Compliance management activities designed to ensure adherence to regulations, or internal operational requirements to ensure efficiently meeting regulations.

3. Strategic Environmental Management activities designed to identify environmental opportunities, to anticipate change, and to respond to emergent trends.

Procedure



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**
- **wastewater treatment**
- **operation of paint line**
- **operating of plating system**
- **management of contractors**

Operational control can be broken down into two plans: a technical control plan and a management control plan. These plans describe technical and management controls identified during the initial review/gap analysis. They delineate responsibilities and authorities for those controls and mention milestones and deliverables in the planning of improvements. They may include budgets for internal capabilities, external support requirements, and actual expenditures for capital equipment. The plans can also quantify expected cost benefits derived from the improvements.

Employees who actually work with procedures should develop new instructions, and modify existing ones. Preparation of documentation to establish EMS Operational Control is delegated to departmental work groups under the direction of the department manager. The department should review environmental requirements and effects within their area of operation as defined in the Aspects, Objectives and Targets. This activity is usually accomplished by the project team.

Integration of operational procedures designed for environmental stewardship with other management systems further illustrates the commitment of the organization to environmental improvement. This integration may be considered in some of the following areas: quality systems, safety procedures, logistics, and financial decisionmaking. EMS Operational Control procedures require a “Do-Check-Correct” approach. To accomplish this, the following steps may be utilized:

1. Establish the Operational Control requirements for the activity in question.

2. Identify the specific portion of the procedure that must be monitored, and document the methodology of process control.

3. Review the monitoring results from (2) above against the requirements of (1) above.

Procedures vs. Instructions

ISO defines procedures and instructions as:

"A procedure is a prescribed series of actions involving several people. The actions are to be executed in a predetermined sequence. Within the sequence, any points of choice are clearly indicated. A procedure always deals with the following matters:

◊ *What needs to be done?*

◊ *Who will have to do it?*

◊ *When will it have to be done?*

An instruction can be described as a prescribed series of actions to be executed by one single employee in a determined sequence; any points of choice are clearly indicated. The difference with a procedure is that several employees are involved with the latter."

In many cases, a generic procedure will be adequate to comply with the ISO 14001 Standard, as well as the concept of EMS. But, if it is determined that a specific written Operational Control procedure is required, the team approach will be effective. Again, it may be found that a procedure required in one department already exists in another, or that there are mutually redundant procedures in two departments. This discovery may allow for the elimination of redundant procedures and consolidation of common departmental control procedures.

The MR or other general management representative may author general procedures. Specific departmental procedures should be written by the department supervisor and the staff members responsible for the activity, or at least edited by them.

Tips

- Use existing procedures wherever possible. Most Significant aspects may already have a procedure written. Simply verify that it is used and that it is accurate.

- When employee education and experience (for professionals involved in highly technical research, for example) determines employee competency, it is less critical to write out instructions. This should not be the sole criterion for establishing operational control. When complex and critical procedures are in question, senior technical staff should also have written procedures at their disposal.

- Once operational controls are established, consider what maintenance and calibration activities will be required for those procedures. Instructions for these activities may be written down in compliance permit applications and equipment manuals.

- Use flow diagrams to ensure understanding of the process involved.

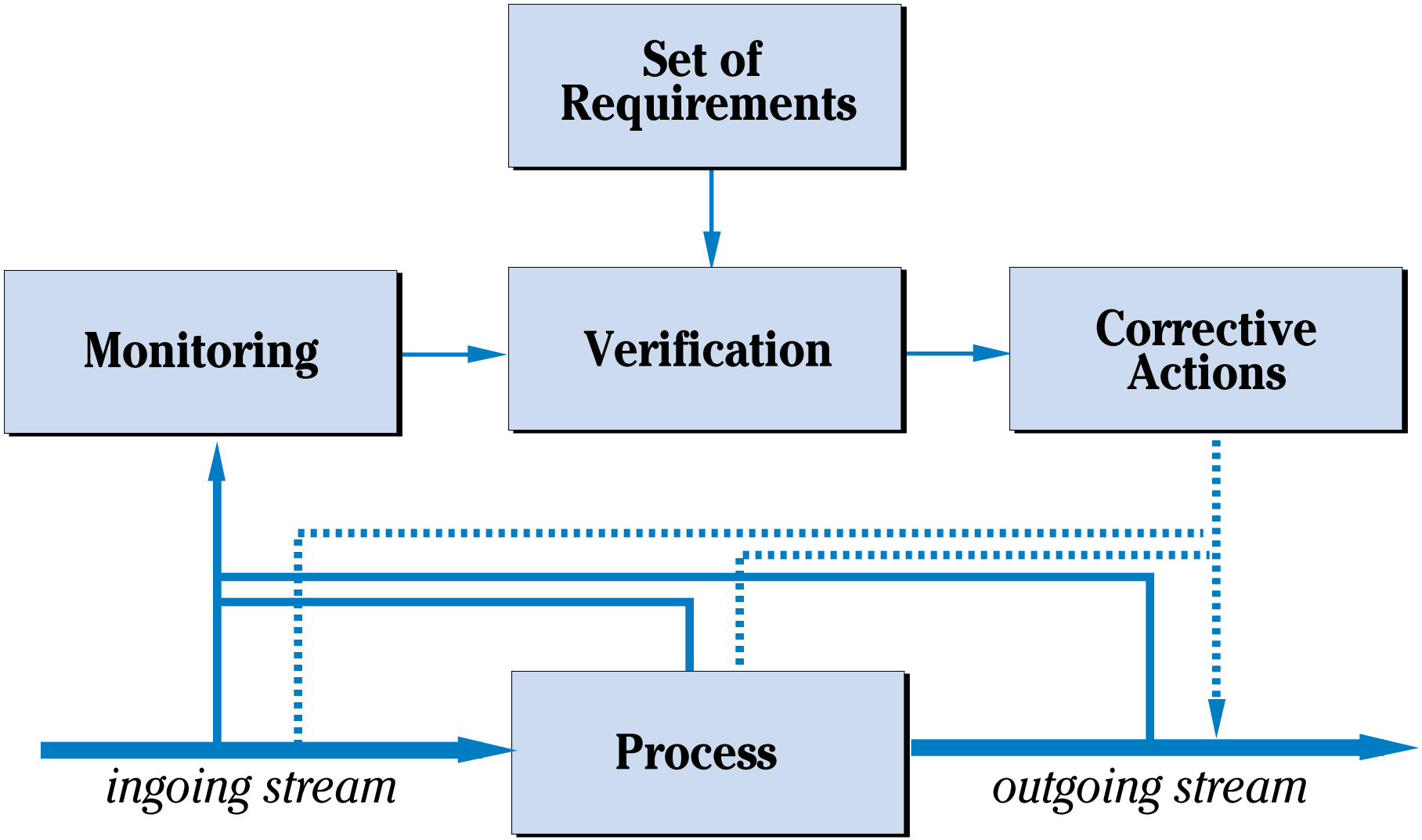
- Break down each procedure by steps.

- Be consistent.

- Review procedures with those performing the work to ensure they are correct and to obtain ideas for improvement (you should also talk with them prior to developing the procedure).

Procedures may include those for subcontractors and suppliers if they have an impact on the organization's significant aspects.

Operational Control



Emergency preparedness and response

ISO 14001 4.4.7

"The organization shall establish and maintain procedures to identify potential for and respond to accidents and emergency situations, and for preventing and mitigating the environmental impacts that may be associated with them.

The organization shall review and revise, where necessary, its emergency preparedness and response procedures, in particular, after the occurrence of accidents or emergency situations.

The organization shall also periodically test such procedures where practicable."

Description

Review:

Are all key procedures reviewed for emergency preparation?

Did you develop procedures for managing these potentialities?

Are personnel trained adequately and is the correct emergency equipment where it should be?

Is there a process to review the emergency system after a drill or incident?

Emergency preparation and procedures should be established to respond to unplanned events. Procedures should define control mechanisms, operational requirements and other controls during these events. Emergencies, as defined by an EMS, include releases to the environment of all types, natural disasters that might lead to releases, and process hazards that might become emergencies.

Emergency preparations for most facilities are usually based upon human health considerations, as they should be. There is a good possibility that health and safety programs have been established which may comply with the standard. They should also include procedures for mitigation of material loss or other financial damages resulting from emergencies.

Purpose

The philosophy behind emergency preparations is to preplan emergency actions to mitigate, reduce, and/or eliminate the environmental health and safety impacts that can carry huge financial implications. This investment is generally recovered the first time a serious incident occurs but is also difficult to quantify. Insurance costs may also be negotiated on the basis of enhanced preparedness.

Procedure

Useful Information:

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

Planning for emergencies should include:

- an emergency assessment process,
- preventive measures,
- organizational responsibilities,
- listing key personnel,
- defining emergency services and their capabilities,
- communication plans,
- actions to take in the event of emergencies,
- hazardous material information, training, planning and practicing in the event of a release.

It should be noted that for some emergency situations, it would be worthwhile to consider the purchase of hazard mitigation equipment, and opening preliminary communication to emergency medical centers. As an example, EPCRA (Emergency Planning and Community Right to Know Act of 1986) mandates this activity for facilities with sufficient inventories of hazardous chemicals.

Emergency drills and plans can be handled in similar fashion to those for fire emergencies. They may be combined into the same plan but should be addressed in separate sections of the plan. Finally, one question should be routinely asked: “Does everyone know what to do in an emergency, and have the local responders been told what could potentially happen?”

Monitoring and measurement

ISO 14001 4.5.1

"The organization shall establish and maintain documented procedures to monitor and measure, on a regular basis, the key characteristics of its operations and activities that can have a significant impact on the environment. This shall include the recording of information to track performance, relevant operational controls and conformance with the organization's environmental objectives and targets.

Monitoring equipment shall be calibrated and maintained and records of this process shall be retained according to the organization's procedures.

The organization shall establish and maintain a documented procedure for periodically evaluating compliance with relevant environmental legislation and regulations."

Description

Measuring and monitoring are performed to see if the EMS Targets and Objectives are being met. The Environmental Management Program establishes Operational Control performance criteria that must be verified. The EMS should include procedures for this measuring and monitoring. The results of this self-critical analysis should be reviewed and used as indicators of the system's success and reliability, as well as identifying those areas in need of Corrective Action or improvement.

Purpose

Identifying the performance indicators an organization will use to monitor the EMS should be an integral part of process engineering, product design, and standard operating procedures. They should be included in work instructions developed in previous sections.

This section of the EMS outlines expectations that those measurements are quantified and collated into some useable form for management review. Since these will be verification measurements that will be used to make capital decisions,

Did you:

- **Identify key process characteristics and how you will monitor them?**
- **Develop a process to review compliance with regulations (audits?).**
- **Determine how to measure the performance relative to the Objectives and Targets?**

they must be accurate and reproducible. They must be relevant to the scope of a firm's Activities and Policy, be technologically feasible and cost-effective, and use non-destructive sampling techniques.

Procedure

"If you can't measure it, you can't manage it."
- Peter Drucker

Which operations and activities can have significant environmental impacts?

What are the key characteristics of these operations and activities?

How do we measure these characteristics?

When performing measuring and monitoring it is essential to:

- Identify and document the measurements that will be performed, and specify the allowable range.
- Identify the time, place and persons performing the measurements.
- Maintain quality control procedures for verification procedures.
- Ensure corrective actions and countermeasures are in place if the measurement is found to be in excess of allowable parameters.
- Procedures for calibration and routine maintenance of equipment utilized should be documented.

This information should, at least in abbreviated form, be included in the Management Review found in subsequent sections of this Guidance Manual.

Tips

- *Keep monitoring requirements limited to KEY process characteristics.*
- *The best systems will combine elements of both Process and Outcome measurements.*
- *Make sure equipment is maintained and calibrated routinely.*
- *Ensure that regulatory compliance is included in the measuring and monitoring programs for the EMS.*
- *Ensure that the measuring and monitoring will verify conformance with the Policy, Targets and Objectives of the EMS.*
- *Focus on those things that you can control!*
- *Make sure you have the resources to implement the program as defined.*
- *Make measuring and monitoring reports applicable to the operational staff and meaningful for management.*
- *Make sure that the difference between environmental performance evaluations (EPE) and audits are clear.*
- *Consider economic studies to determine cost of effort versus economic return on investment. Some activities won't or can't justify their implementation (cost ineffective).*

Audits vs. EPE

Audits:
Periodic
Independent
Verify conformance
A sampling of data

EPE:
Continual
Frequent
Operations responsibility
Assess process performance

Nonconformance and corrective and preventive action

ISO 14001 4.5.2

"The organization shall establish and maintain procedures for defining responsibility and authority for handling and investigating nonconformance, taking corrective action to mitigate any impacts caused and for initiating and completing corrective and preventive action.

Any corrective or preventive action taken to eliminate the causes of actual and potential nonconformances shall be appropriate to the magnitude of problems and commensurate with the environmental impact encountered.

The organization shall implement and record any changes in the documented procedures resulting from corrective and preventive action."

Description

The results of Monitoring and Measurements, audit findings and other systemic reviews should be documented and reviewed, and must lead to Corrective Actions. Procedures should be in place so that the organization can ensure that Corrective Action has taken place, and that it has been effective. Further, the root cause of the systemic failure should be determined, if possible. And, patterns and trends should be noted and analyzed.

Some steps to achieve this end might be:

Fixing EMS problems and avoiding them in the future

1. Inform the employees that it is everyone's responsibility to identify and perform corrective actions. This would include reporting non-conformances of operational and procedural natures. Specific steps should be outlined to effect that reporting.

2. As with the reporting of Corrective Actions, it should be clear to all employees of an organization that everyone is responsible for solving non-conformances as well. Emphasis on problem solving, rather than focusing on the negative aspects of human error can go a long way in achieving this goal.

Foster the belief that the concepts of "continual improvement"

are the basis of everyone's performance review. It would be difficult to identify any aspect of a person's performance that is more crucial than the belief that they can improve in some way, every day!

Purpose

The corrective action portion of any EMS will be the most heavily scrutinized portion of the System by regulatory agencies in the event of a catastrophe. It will also be one of the most scrutinized portions of the EMS during a Registrar's audit because of its importance in reducing the potential of a catastrophe. Registrars may expect an organization to show documentation that several corrective actions have taken place which conform to the design specifications of the EMS, and that follow-up has occurred.

Deviations from the norm may be either singular or regular in their frequency. There are a great many causes for such failures, including items such as human fatigue, error, poor equipment or equipment maintenance, or errors in the design of the EMS itself. By recording the events of a non-conformance and its Corrective Action, patterns of success and failure of the EMS can be reviewed and the system, the equipment, or the people adjusted accordingly.

Procedure

Procedures must be maintained for defining responsibility and authority, investigating non-conformances with the EMS and taking action to correct impacts when requirements are not met. If there is a pattern of non-conformance recognizable, good policy is to register the Corrective Action and report it. Usually, Corrective Actions are the responsibility of the supervisor in a department, because Corrective Actions are usually aimed at the behavior of individuals. Procedures for inquiry and corrective measures are:

◊ Determine the cause

◊ Decide if immediate action is required

◊ Decide which action should be taken

◊ Take action to lower the risks to acceptable levels

◊ Check to see if measures are effective

◊ Record shortcoming of Corrective Actions

◊ Record changes in procedures required to avoid duplication

Did you:

Design a process for investigating, correcting and preventing system deficiencies?

Design a process to assign roles and responsibilities for monitoring the completion of corrective actions?

Design a process to revise the procedures or documents that are the basis for corrective actions under the EMS?

It is also important to illustrate the differentiation of Corrective Actions from Preventative Actions within the organization. Preventive Actions may include analysis of environmental performance indicators previously discussed to determine probabilities of non-conformance. Corrective Action will be the process changes or procedural activities that are initiated if and when the preventative actions detect a problem.

Corrective Actions are, many times, the most difficult to initiate in an organization. Hurt feelings may arise from any steps taken to dictate changes in procedures for an individual after an incident. As such, this should be handled with care to prevent the entire process from becoming a “witchhunt”. A reasonable approach would be to structure the process in the form of assistance for the employee or department involved. Ask them what they think should be done to resolve the issue, what they think could be done to ensure it does not recur, and do what can be done to include their input if it is reasonable, in the final solution.

Steps to develop a Corrective Action program:

1. The MR should review and record pertinent EMS performance information with management and employees alike. This should include: complaints from customers, agencies and third parties, monitoring deviations, raw materials costs reductions, accidents, process improvement resulting in waste reduction, pollution prevention or other lessening of environmental impact.

2. Preventative action results from the analysis of data. If the analysis finds trouble, then corrective action is taken. To

fully implement the system, costs data for environmental aspects should be analyzed and reviewed for possible improvements, processes should be analyzed to see if there are avenues for improvement or for solving repeat problems. Work teams should be encouraged to solve these problems as they arise.

3. This portion of the system will be the basis for tracking and recognizing opportunities for continuous improvement for the EMS and for the environmental performance of the company. Many well-developed systems fail because they can't differentiate individual failure in procedures that are either not performed correctly or done well from procedures that, from a design perspective, do not accomplish the desired goal.

Records

ISO 14001 4.5.3

"The organization shall establish and maintain procedures for the identification, maintenance and disposition of environmental records. These records shall include training records and the results of audits and reviews.

Environmental records shall be legible, identifiable and traceable to the activity, product or service involved. Environmental records shall be stored and maintained in such a way that they are readily retrievable and protected against damage, deterioration or loss. Their retention times shall be established and recorded.

Records shall be maintained, as appropriate to the system and to the organization, to demonstrate conformance to the requirements of this International Standard."

Description

Check to see:

Are all the records to be maintained identified?

Are retention times determined?

Is there a good storage and retrieval system in place?

Records are required to demonstrate compliance with the EMS. They're collected within the framework of the EMS, and they record the extent to which the EMS design is performing. Procedures are developed to maintain, identify, collect, index, and store records. Included in the records being maintained by the system are contractor, procurement, audit, management review, and training records necessary for the confirmation of the EMS.

Records should be legible and identify the activity, product, or service involved. Records should include details of non-conformance and corrective actions, records of regulatory violations and corrective actions, incident reports and follow-ups, complaints and responses, supplier and contractor information, inspection and maintenance records, MSDS, and monitoring data. Records management under an ISO 14001 EMS must be able to prove that the organization is actually doing what it says!

Purpose

For the purposes of EMS Registration, or seeking relief under the EPA's Self-Policing Policy, a firm must have documented proof of their activities as they relate to EMS practices. A Registrar may wish to see some months of systems records in order to approve the Registration of the EMS to the Standard.

Procedure

The retention and maintenance of records associated with your EMS serve several purposes. Primarily, these records are the *evidence* of an effectively operated EMS. This evidence must be shown to registrars and auditors to verify that your EMS conforms to the ISO 14001 Standard. Also, these records may include procedures that have been removed from service which are retained for an operational history of mothballed equipment or to retain operating expertise for techniques that have been supplanted. You may choose to integrate the Record-keeping aspect of your EMS with other record keeping. Be advised that, since this Record-keeping is an auditable portion of the EMS operation, you should be sure when you include any record or sets of records in this process.

Records can be maintained, as were the documents, in either paper or electronic form. For records in electronic form, good MIS procedures should be followed. A listing of the files in storage, their format, and their retention time, may be some of the considerations that would be made. For paper records, you should establish steps to protect these records such as putting sensitive records in fire-proof cabinets, not storing crucial records in basements prone to flooding, and the like. A master list of stored records should be maintained that includes: name of record, why stored, where stored, format of storage (paper or electronic, etc.…), retention time, final disposal determination and decision matrix. It is also prudent to maintain a record of those records destroyed, under whose authority and the date of destruction.

Some of the records that should be maintained in your EMS

include:

- Legal and other requirements listing.
- Environmental Aspects determination documentation.
- Training records.
- Inspection and monitoring data.
- Calibration and maintenance records for instrumentation.
- Non-conformance and corrective actions records and reports.
- Environmental audits and management review documentation.
- Records of emergency response drills.
- Contractor and Supplier notifications regarding your Aspects.

Tips

- ➢ Identify all environmental information required for the operation of your EMS and determine which records should be maintained under this portion of the Standard.
- ➢ What are your organization's capabilities for maintaining these records? (Electronic media is more efficient for this purpose where possible.)
- ➢ Are there process records that might be included in this Record-keeping?
- ➢ Can you easily retrieve any records that are centrally important?
- ➢ Are your records safe?

Environmental management system audit

ISO 14001 4.5.4

"The organization shall establish and maintain (a) programme(s) and procedures for periodic environmental management systems audits to be carried out, in order to:

a) determine whether or not the environmental management system

1. conforms to planned arrangements for environmental management including the requirements of this International Standard; and

2. has been properly implemented and maintained; and

b) provide information on the results of audits to management.

The organization's audit programme, including any schedule, shall be based on the environmental importance of the activity concerned and the results of previous audits. In order to be comprehensive, the audit procedures shall cover the audit scope, frequency and methodologies, as well as the responsibilities and requirements for conducting audits and reporting results."

Description

An EMS must include a routine systems audit. This audit should determine compliance with the ISO 14001 EMS, and may also be combined with regulatory compliance audits, quality audits, energy audits and other forms of management inquiry if so desired. BUT be careful to ensure that any combined audit be well conceived. You don't want a finding about your quality system to effect the results of your environmental audit or visa versa.

A combined environmental compliance audit and EMS audit makes the most sense. The requirements of ISO 14001 do not require compliance with regulations, but they do require the commitment to compliance and routine monitoring of your compliance status. As a result, compliance is more closely related to EMS auditing than quality auditing. An energy audit

Auditing Questions:

Is there an auditing program developed?

How frequently will audits be performed?

Are the auditors selected, trained and capable?

Are audit procedures described in the EMS program (check 14010,14011 and 14012 during this phase for guidance)?

Is audit record keeping described?

is also easily fit in. But, combining quality, compliance and EMS audits into a single audit may prove difficult. Logistics, alone, will be troublesome and disruptive to the operation, but the real issue will be the assembly of adequate audit team resources to perform a professional audit of those aspects at once.

Whether or not internal or third party auditors are used, they should possess the qualifications outlined in ISO 14012:

1. Expertise in environmental science and technology.
2. Expertise in the technical and environmental aspects of facilities operations.
3. Expertise in environmental law, regulations.
4. Expertise in environmental management systems.
5. Expertise in EMS auditing techniques.

These qualifications are *essential* for auditors. Any firm should be inquisitive in determining the qualifications of external auditors. An auditor should be registered with a recognized environmental auditor certification scheme such as the Environmental Auditor Registration Association (EARA) in England or ANSI/RAB* in the United States. Without the above areas of expertise, the systems audit will NOT yield operational information that will be useful for the achievement of continual improvement. Auditors with expertise in quality systems, legal compliance or other singular portions of the EMS arena will not be capable of determining whether or not technical Operational Controls have been effectively established in the system's development. This could most certainly become grounds for enforcement agencies to rule against the entire EMS audit as illustrating a reasonable “Standard of Care” or "Good Faith Effort".

* American National Standards Institute/Registrar Accreditation Board

Purpose

External auditing is recommended for ISO 14001 EMS. Further, EPA requirements for their Self-Policing Policy, and Star Track Program includes independent auditing. The neutral vision of the auditor is at the core of this concern. The intent of auditing is to supply management with better vision from which they make decisions. In-house staff may not be comfortable delivering completely objective information critical enough to be useful for system modification. This is not at issue with third party auditors. But, one of the best ways to train internal facility staff in operating their EMS is to involve staff from one department in the audits of another. This can be performed in conjunction with independent third party auditors to gain "internal" perspective as well as external.

Procedure

It is essential to develop procedures that clarify audit scope, audit frequency, auditor qualifications, reporting requirements, follow-up. Two major objectives should be expected from an audit:

- The determination of compliance with the environmental management system as outlined by the Objectives and Targets, Aspects, Environmental Management Program, the Environmental Manual, Procedures, and work instructions, and to check for effective implementation of them all.

- Determine if the system is effective in achieving the expectations of the Policy.

If the system is to be Registered, early inquiry with the Registrar auditor is important. They may supply information concerning their expectations of audit procedures that will aid in the development of the EMS to their interpretation of the Standard, as well as the specificity of the auditors who will Register it. Special emphasis should be placed on the individual areas to be considered, i.e. organizational structure, operational and administrative procedures, work instructions, operational controls, process engineering, emergency

preparedness, and the audit intensity should be clarified.

Prudence mandates Registrars of "quality" to add credence to the entire process. Combined audits with quality systems audits are possible, but separate certifications should be demanded. Experience has found this procedure to be cost effective, but not systematically or temporally effective.

Tips

- Focus on objective conformance evidence. Use the Standard as your template for audit protocols.
- Discuss audit findings with operational staff during the audit. This may lead to a better understanding of root causes and systemic failures.
- Perform audits with a team that has the requisite technical, regulatory, legal, management, and operational expertise to effectively determine "operational control".
- Consider auditing for EMS conformance along with regulatory compliance. BUT…this will require auditors of significant expertise in BOTH areas. Also, the structure of the EMS audit protocol should address some of the legal issues at the heart of any audit.

Management Review

ISO 14001 4.4.6

"The organization's top management shall, at intervals that it determines, review the environmental management system, to ensure its continuing suitability, adequacy and effectiveness. The management review process shall ensure that the necessary information is collected to allow management to carry out this evaluation. This review shall be documented.

The management review shall address the possible need 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."

Description

Management Review?

Is "top management" involved in the process?

Are the results being documented?

Is there a follow-up procedure for action items that result from the review?

Does the review include the financial efficacy of the program's activities?

Management Review is an essential portion of the continual improvement of the organization's EMS. The improvement process does not end with the establishment of an initial Policy, realization of initial Objectives, or certification of the EMS to a Standard. Management Review is the essential element for systems improvement, along with preventive and corrective action.

A Management Review of the EMS must be of a scope to include all environmental potentialities for organizational activities, products, and services. This may include the financial impacts of these environmental potentialities and how the environmental concerns of the firm might relate to business opportunity.

Purpose

The Review must assess the extent of compliance or non-conformance to the EMS Standard, and then review the effectiveness of Corrective Action. Management Review should also suggest corrective measures to solve problems identified in EMS design, intent, or scope. The form of the Management Review could be a dedicated internal audit of the system for "top management". This Audit and Review will only be effective if the participants have the expertise outlined in

ISO 14012 for EMS auditors. The report from such a review should be submitted to top management, the MR, and appropriate line management specific to the operation being reviewed.

Procedure

The MR should plan for conducting the required Management Review. The agenda should include review of instances of nonconformance, Corrective Actions, continuous improvements associated with the EMS, results of compliance and EMS Audits, complaints, results of any pollution prevention programs, waste minimization programs, and a summation of Measurement and Monitoring results.

The MR, along with the CEO, Director of EH&S, and other senior management representatives should review the overall effectiveness of the EMS in meeting the Targets and Objectives of the system. The results of the review should be used to determine modifications to the EMS required for achieving continuous improvement. Follow-up at a later date to verify that the EMS modifications were effective is also needed.

The Review process should:

⇒ Assess whether company personnel have complied with Policy and Procedures using audit reports. Review recommendations concerning the EMS in Audits and other reviews and how these might be implemented. Consider the continued appropriateness of Environmental Aspects and their rating.

⇒ Review Targets, Objectives, and environmental performance indicators to establish their continued suitability in light of changing environmental impact and concerns, regulatory developments, concerns among interested parties, market pressures, internal changes/organizational activity changes, and changes in the environment. Determine if Targets and Objectives are being met.

⇒ Determine if capital resources are adequate for supporting

the EMS requirements of the firm.

⇒ Review regulatory compliance and whether EMS requirements have been achieved. Determine root causes of systemic non-conformances.

⇒ Determine if the Operational Controls, Procedures, Corrective Actions, Preventative measures, and Continuous Improvement efforts have resulted in enhanced environmental performance. Document changes that result in process improvement.

⇒ Determine if energy efficiencies, accounting practices, information management systems are adequate.

⇒ Determine areas of improvement in organizational structure, staff expertise, practices, administrative and operational procedures, training, work instructions, process improvements, pollution prevention programs, energy utilization, accounting practices which may lead to environmental opportunities and increased profit margins.

⇒ Formulate corrective actions, preventative measures as a result of the review of systems nonconformance, and verify Corrective Actions are effective and appropriate.

Tips

- Include people with the right information as well as people who can make the decisions.
- Combine the management Review with other meetings.
- Document the results of the management review and maintain records of the meeting.
- Any changes since the last management review should be considered as to how they might impact the actual or potential environmental aspects of the firm.
- Someone must be responsible for follow-up.

Implementation

After the EMS has been developed, implementation follows. To demonstrate compliance with EMS Standards, organization employees need to demonstrate an understanding of their responsibilities relative to the EMS system. A first step in implementation could be to distribute EMS procedures and individual work instructions to the staff during training. They should have been reviewed by employees during procedural development. Training should point out individual requirements under the EMS, as well as organizational requirements to achieve Registration if applicable. Training needs of the employees should have been documented in the roles and responsibilities and determined by the organizational structure.

Implementation of an EMS to any Standard must be carefully prepared and effected. Because the implementation process may require a significant portion of the organization resources for a period of time, it may be best to have a steering committee oversee this phase in a larger organization. For simplicity's sake, this should be the Project Team from EMS design.

For effective implementation a simplified design which limits formalization of the system will be easiest. Personnel must be motivated commensurate to their expected contribution to EMS development and implementation. A functional approach that focuses on the following will be most effective:

1. Are there significant environmental aspects and risks covered by procedures and instructions, and are these documented?

2. Are the systems requirements appropriate to the nature and significance of the environmental aspects in the sphere of influence of the specific employee?

3. Have successful historic practices been included in the EMS design?

4. Have positive "corporate culture" environmental issues been optimized in the implementation process?

Implementation will ONLY be effective if those who need to act

have been motivated to become involved. The effort from individual employees should directly relate to the environmental impacts of their operational responsibilities. Training should promote this awareness. The individual should also have the time required to actually perform tasks that they have been assigned relating to the EMS. Performance should be acknowledged and rewarded.

Integration

Full integration of the EMS with other management tools is essential, and a foundational concept of any EMS approach. This integration may be in the form of sharing organizational values, uniformity of control mechanisms, standard work practices, and administrative procedures. Specifically, integration should be seriously considered with financial accounting practices and life cycle assessment for achievement of full cost accounting. Even the most rudimentary applications of this integration can lead to significant reductions in costs, as well as significant increases in the capabilities of executive management to “see” environmental issues in their full light through more accurate financial measures of specific activities.

Strategic Environmental Management elements that should be integrated with existing management practices:

◊ Policies

◊ Allocation of resources

◊ Operational Controls mechanisms

◊ Information systems

◊ Training programs

◊ Staff development

◊ Organizational structure

◊ Responsibilities/accountability

◊ Staff Review and Compensation

◊ Measurement/Monitoring systems

◊ Documentation/Communication/reporting

Procedural/integration issues, because they are “owned” by specific managers who may be involved in the EMS development process, may best be handled by third party EMS developers. Managers often become defensive for those procedures under their control, and may be wary of relinquishing control to others. An objective third party may be best capable of identifying where combining practices are to be used.

ISO 14001 EMS implementation is easily understood when one spends time with the concepts. All become enthusiastic about the enhanced control of operations, the clarity of purpose and responsibility, and the support of top management throughout the organization. To paraphrase Dr. Benjamin Spock, the world-renowned pediatrician, an EMS is “Reasonable guidelines, reasonably enforced”. Dr. Spock would consider an ISO 14001 EMS “good parenting” of the environmental function.

During implementation, both top management and departmental team members play crucial roles. Since implementation on the shop floor requires constant attention, the departmental team members must be relied on to supply that effort, support and motivation. This is especially important where employees' regular job functions absorb the bulk of their time, and they have little time to devote to the implementation of the EMS. If so, new practices, procedures, and personnel should be used so that all members of the production and management team can fully support their portion of the EMS. There will always be the traditional resistance to change. To ensure success, the following formula is effective:

- Commitment of top management
- Financial support
- Motivated and supporting department team

- Ample on-the-job training and information

After implementation, actual environmental performance should be recorded and assessed. When the internal staff feels confident that the system is working well, then a third-party auditor should be considered. Once this first level of external auditing has been satisfied, then the EMS can be said to be effective. Only certification remains, where desired.

Questions to Ponder During Management Reviews

- Did we achieve our **objectives and targets**? (If not, why not?) Should we modify our objectives?
- Is our environmental **policy** still relevant to what we do?
- Are **roles and responsibilities** clear and do they make sense?
- Are we applying **resources** appropriately?
- Are the **procedures** clear and adequate? Do we need others? Should we eliminate some?
- Are we **monitoring our EMS** (e.g., via system audits)? What do the results of those audits tell us?
- What effects have **changes in materials, products, or services** had on our EMS and its effectiveness?
- Do changes in **laws or regulations** require us to change some of our approaches?
- What **stockholder concerns** have been raised since our last review?
- Is there a **better way**? What else can we do to **improve**?

The Registration Process

What gets Registered?

ISO 14001 EMS Registration will cover the environmental management system of a particular business operation. A single certificate can cover a specific site of a company, a specific facility, several sites or facilities, or portions of sites or facilities. For example, one ISO 14001 certificate might register a business unit that encompasses six different sites in six different states, and a portion of a site in a seventh state. If these sites are audited at the same time against the same Standard, they can be covered under a single certificate.

However, it is unlikely that a company will receive six different certificates for six different production units at a single site, since most environmental aspects of a facility are closely related to a site. This differs from the ISO 9000 series of quality standards. The quality management system for production of one product may be covered under one certificate, while other processes or products at the same site could be covered by subsequent certificates.

A certificate of registration is usually valid for three years, though this can vary depending on the certification body. Some Registrars provide indefinite certificates, pending continuing successful surveillance visits. In most cases, certification bodies conduct surveillance audits on a six-month schedule. When a certificate expires, the Registrar conducts either a complete reassessment at the end of the certification period or an assessment that is somewhere between a surveillance visit and a complete reassessment.

"Accreditation", "Certification", and "Registration"

The following distinctions among the three terms are derived from the International Organization for Standardization:

⇒ **Certification** is a procedure by which a *third party* gives written assurance that a product, process, or service conforms to specified requirements. Certification to ISO 14001 stipulates that a company is in compliance with an environmental management system (EMS) that meets all

requirements of ISO 14001.

⇒ **Accreditation** is a procedure by which an *authoritative body* gives formal recognition that a body or person is competent to carry out specific tasks. With regard to ISO 14001, accreditation means that a body is authorized to grant certification to a company that it has successfully assessed as meeting ISO 14001 EMS requirements and as having the processes in place to maintain that system.

⇒ **Registration** is a procedure by which a body indicates relevant characteristics of a product, process, or service and then includes or registers the product, process, or service in a publicly available list.

In the United States the term "registration" is used interchangeably with "certification" in the context of management system standard conformance. In Europe, environmental management systems *certification* is the proper term, rather than environmental management systems *registration,* which is the US terminology.

Registrars and Registration

Overview of the Typical **EMS Registration Process**:

1. **Application**
2. **EMS Documentation**
3. **On-site EMS Readiness Review**
4. **Registration Audit**
5. **Registration Determination**
6. **Surveillance**

Environmental management system registration is the assessment and audit of an organization's environmental management system by a third party, likely to be known as a certification body or a "Registrar" in US terminology. The Registrar evaluates an environmental management system for conformity to ISO 14001.

The evaluation will include an examination of the company's environmental policy, environmental management system and its documentation, EMS auditing program and procedures, and environmental records. It will include a thorough on-site audit to determine conformance to the ISO 14001 Standard. When a company's environmental management system is verified to conform to the requirements of ISO 14001, the Certifier will issue a certificate describing the scope of the company's environmental management system that has been certified. The certification is then listed in a register or directory that is available to the public. The Registrar allows the company to display the Registrar's mark on advertising, stationery, etc., as evidence that it has achieved certification.

Self Certification /Self Declaration

Information sources to consider:

- **audit results**
- **internal suggestions**
- **external communications**
- **progress on objectives and targets**
- **other environmental performance measures**
- **reports of emergencies, spills, other incidents**
- **new or modified legislation and regulations**
- **new scientific/technical data on materials and processes used by the organization**

One of the key battles of the ISO 14000 series drafting process was whether companies can "self-certify," or must use external registrar auditors to verify compliance with ISO 14001. European countries pushed for an EMS-style system where companies are externally audited, and reports of those audits are provided to the public. However, that position did not prevail in the ISO arena: companies can perform their ISO 14001 audits internally and declare that they are in compliance. Many feel that such "self-certifications" will have no credibility. However, self-certification will satisfy the ISO standard, and may offer certain advantages for firms who wish to develop internal practices that they do not want reviewed by external Registrars. It is quite possible for such a firm to develop an ISO 14001 EMS, Self-Declare, and retain significant control over external review of the system.

While third-party certification and self-declaration are acceptable for ISO 14001, both types of assessments have advantages, and experts are divided on their relative values. Independent assessment potentially provides management with a less biased opinion and self-assessment provides greater depth of knowledge on the subject.

Statistical investigation notes that the perceived value of the ISO 14001 EMS lies in the process for awarding the certificate. That process entails investigation by qualified independent auditors using the Standard as a uniform tool and not in a discretionary manner. The criteria for auditing and auditor skills must be consistent to have national and international value for certified audits. But, there is also significant skepticism regarding the universal recognition of certifications. One must be extremely careful regarding the selection of a Registrar.

Because ISO 14001 is an international standard developed by consensus with scores of countries participating, it is accepted worldwide. Therefore, a certificate issued by an accredited certification body should be acceptable to all customers of a firm worldwide. However, acceptance depends on mutual recognition among accreditation bodies. Mutual recognition means that a company's certificate awarded by an accredited certification body in one nation will be accepted by the accreditation agency (and by all customers) in other nations. Mutual recognition is an unsettled issue, and agreements are being developed in this area.