

US EPA ARCHIVE DOCUMENT

ADDITIONAL TOOLS

Additional tools provided in this Appendix include:

- A list of requirements for an EMS.
- A PowerPoint presentation entitled, “Environmental Management Systems: Taking Charge of Your Environmental Management Issues;”
- A PowerPoint presentation entitled, “Specialty-batch Chemical Manufacturing: Environmental Management Systems Implementation;” and
- Launch and Implementation Tools, including:
 - Launch Guidance Document and EMS Management Review Meeting forms;
 - An Environmental Management System development and implementation flowchart; and
 - An EMS development and implementation schedule.

List of Requirements for an EMS

Who/What	Responsibilities
Top Management	• Define the Environmental Policy • Provide resources essential to the implementation and control of the EMS • Appoint a specific Environmental Management Representative (EMR) • Review the EMS • Address the possible need for changes to policy, objectives, and other elements of the EMS in light of audit results, changing circumstances, and continual improvement
Environmental Policy	• Be appropriate to the nature, scale, and environmental impacts of the facility’s activities and services • Include a commitment to continual improvement • Include a commitment to comply with relevant environmental legislation regulations and other requirements to which the facility subscribes • Provide the framework for setting and reviewing environmental objectives and targets • Be documented, implemented, maintained, and communicated to all employees • Be available to the public
Facility	• Establish and maintain procedures to identify environmental aspects • Ensure that aspects related to significant impacts are considered in setting objectives • Keep aspects information up to date • Establish and maintain procedures to identify and have access to legal and other requirements

Who/What	Responsibilities
	• Establish and maintain documented environmental objectives and targets • Consider legal and other requirements, significant environmental aspects, technological options, financial operations and business requirements, and views of interested parties • Establish and maintain programs for achieving objectives and targets • Identify training needs • Require that all personnel whose work may create a significant impact receive appropriate training • Establish and maintain procedures to make employees at all levels aware of importance of conformance to requirements of the EMS • Establish and maintain procedures to make employees at all levels aware of the significant environmental aspects of their work and benefits of improved personal performance • Establish and maintain procedures to make employees at all levels aware of the potential consequences of departure from specified operating procedures • Establish and maintain procedures for internal communication between various levels of the facility • Establish and maintain procedures for responding to relevant communication from external interested parties • Consider processes for external communication on its significant environmental aspects and record the decision • Establish and maintain information (in paper or electronic form) to describe the core elements of the EMS and provide direction to related documentation • Establish and maintain procedures for controlling all environmental documents • Identify those operations or activities that are associated with the identified significant environmental aspects • Plan activities, including maintenance, to ensure that they are carried out under specific conditions • Establish and maintain documented procedures for significant aspects to cover situations where their absence could lead to deviations from the policy, objectives, and targets • Establish and maintain procedures to identify and respond to accidents and emergencies • Review and revise, where necessary, the emergency preparedness and response procedures (particularly after the occurrence of an accident) • Periodically test the emergency preparedness and response procedure

Who/What	Responsibilities
	- Establish and maintain documented procedures to monitor and measure, on a regular basis, the key characteristics of operations and activities that have significant environmental impacts - Record information to track performance for defining responsibility and authority for investigating nonconformance, taking action to mitigate impacts caused, and initiating and completing corrective actions - Implement and record changes in the documented procedures resulting from corrective or preventive actions - Establish and maintain procedures for the identification, maintenance, and disposition of environmental records - Establish and maintain programs and procedures for periodic EMS audits
Objectives and Targets	Be consistent with the Environmental Policy, including the commitment to pollution prevention
Environmental Programs	- Include designation of responsibility for achieving objectives and targets - Include the means and time frame by which objects and targets are to be achieved - Be amended to address new developments or modifications
Environmental Management Representative (EMR)	- Have defined role, responsibility, and authority for ensuring EMS requirements are established - Have defined role, responsibility, and authority for reporting on the performance of the EMS to top management
EMS Coordinator	- Responsible for identifying, assigning, scheduling, providing the necessary support for, and ensuring completion of all tasks relating to the EMS - Works closely with the CFT - Responsible for maintaining the EMS manual, under leadership of the EMR
Personnel Performing Tasks Related to Significant Environmental Impacts	Be competent on the basis of training education or experience
Documents	- Be easily located - Be periodically reviewed, revised as necessary, and approved for adequacy by authorized persons - Be current and available at all locations where operations are performed - Be legible - Be dated (with dates of revision) - Be maintained in an orderly manner - Be retained for a specific period

Who/What	Responsibilities
Obsolete Documents	• Be promptly removed from all points of issue or otherwise assured against unintended use • Retained for legal or knowledge preservation purposes
Procedures Related to Significant Environmental Aspects	• Define normal operating criteria • Be communicated to suppliers and contractors
Monitoring Equipment	• Be calibrated, maintained, and retain records of this process
Corrective or Preventive Actions	• Be appropriate to the magnitude of problems and commensurate with the environmental impact encountered
Environmental Records	• Be legible, identifiable, and traceable to the activity, product, or service involved • Be stored and maintained in a way that they are readily retrievable and protected from damage, deterioration, or loss • Contain specific recorded retention times • Be maintained as appropriate to the system and the facility to demonstrate conformance to the requirements of the EMS
EMS Audits	• Be carried out to determine if the EMS conforms to planned arrangements and has been properly implemented and maintained • Provide information to top management • Be prioritized based on environmental importance and the result of previous audits

Environmental Management Systems: Taking Charge of Your Environmental Management Issues

{Facility Name}

2/17/2004

1

The Challenge

The specialty-batch chemical manufacturing industry faces a wide range of pressures

- Increasing costs
- Growing community concerns
- Changing employee expectations
- Increasing customer demands & requirements
- Greater competition

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The Challenge

Many managers are in constant fire-fighting mode in dealing with environmental affairs

- Without a clear direction, environmental issues drop to the bottom of the list until they are urgent
- Urgency, limited staff time, and lack of expertise often limit options and the effectiveness of environmental actions
- Root causes are often not addressed, so reactive mode of crisis/response continues

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EMS: Take Charge of Your Environmental Efforts

An environmental management system (EMS) can help a company

- Take control through understanding root causes & having time to develop effective solutions that address underlying conditions
- Shift from a reactive to proactive approach to addressing environmental efforts
- Integrate environmental efforts with business priorities and concerns

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An EMS Builds on What you Already Do

- You don't have to reinvent the wheel
- Existing environmental efforts can be leveraged to provide more efficiency & value
- EMS can be integrated with Quality management systems such as ISO 9000
- You will examine what you have now, identify where you want to go, and address any gaps

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EMS Uses a Plan-Do-Check-Act Approach

- Based on quality management principles that have shown their value in all types & sizes of businesses worldwide
- Recognizes that perfection is the goal, but is never fully attained
- EMS is dynamic, allowing you to continue to adapt as future conditions change
- Focuses on continual improvement

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An EMS Will Help You:

- Evaluate & define success in environmental & business terms

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An EMS Will Help You:

- Understand & prioritize environmental issues and address them in a proactive manner
 - Though important, regulations don't necessarily help you understand what to do first or how far to take it
 - By aligning environmental priorities with business goals, you can focus first on those issues that provide benefits on both fronts

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An EMS Will Help You:

- Identify clear objectives & tracking mechanisms
 - Improvements don't happen on their own – you need to state what you want to accomplish & by when
 - You manage what you measure, so stating clear interim goals & having a means of measuring progress are crucial

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An EMS Will Help You:

- Promote ownership of environmental issues throughout your work force
 - Environmental management must be everyone's job
 - EMS can create environmental awareness & the structure needed to achieve environmental improvement across your organization

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An EMS Will Help You:

- Establish or improve controls over significant environmental impacts
 - Early stages of EMS development will identify your most important issues; appropriate priorities for action will be visible
 - Specific actions (e.g., pollution prevention, equipment modifications, process changes, training, communication) provide the means for accomplishing your goals & long-term objectives

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An EMS Will Help You:

- Develop and/or streamline internal processes
 - Thinking about control measures can lead to opportunities to simplify processes & practices
 - Eliminating or controlling environmental impacts can make job functions easier & reduce direct & indirect costs
 - Formal processes to anticipate, detect & correct problems can yield big dividends in the form of saving money, building credibility & maintaining goodwill

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An EMS Will Help you:

- Report your progress to your management, regulators, customers & the community
 - EMS provides the structure to measure progress against goals
 - Reporting progress to stakeholders builds trust & credibility

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What it Takes

- Sustained effort
- Top management dedication to excellence & leadership
- Resources – your own people & some limited outside help

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But, a Properly Implemented EMS...



Should Pay for Itself Many Times Over

- The process yields new opportunities for savings
- Operating costs savings are permanent
- Many companies have surprised themselves
 - Better than expected environmental & financial performance
 - Burden of formalizing approaches & developing all the connections not as great as people fear

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Benefits of an EMS

An EMS will help {Facility Name} achieve:

- More control over a rapidly evolving, increasingly important business factor – The Environment
- Better planning & therefore, fewer surprises
- Improved efficiency & lower costs
- Enhanced employee morale & retention
- Better relations with regulators & the community
- Potential regulatory relief
- Stronger customer relationships & competitive position

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The Bottom Line

Companies don't do EMS because it's a nice idea – they do it because it helps them achieve better business results



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Why Pursue EMS Now?

- EPA's Performance Track Program is providing recognition and developing other regulatory benefits (including lowering inspection priority and reducing monitoring & reporting requirements) for facilities with EMS
- State government programs are also recognizing & rewarding facilities with EMS

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SPECIALTY-BATCH CHEMICAL MANUFACTURING Environmental Management Systems Implementation

Module 1

Laying the Groundwork

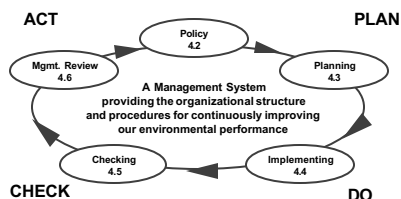
What an EMS is:

- A management system standard
- A management system that commits to compliance with environmental regulations
- A road map by which a company can meet its environmental goals
- A system built on previously existing programs and procedures
- A continuous improvement process
- An accountability process ("Say what you do, do what you say, prove it")
- An awareness program for the employees and the community
- A human-based system

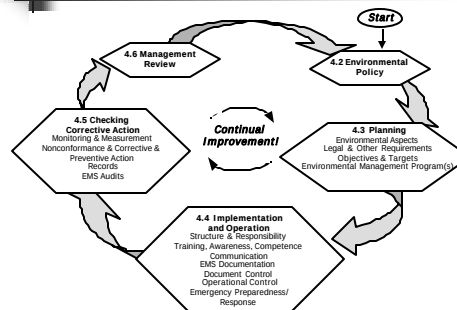
What an EMS is not:

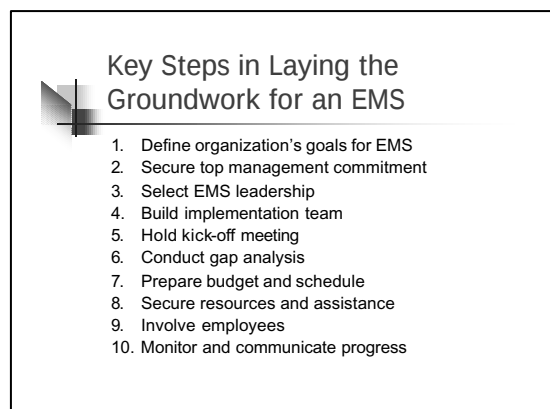
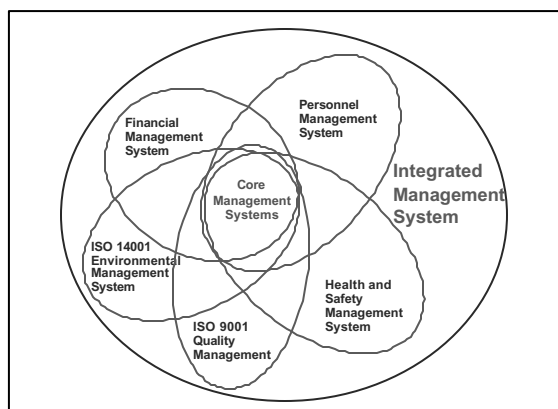
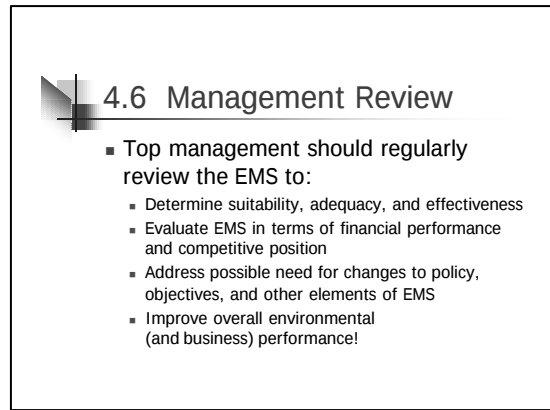
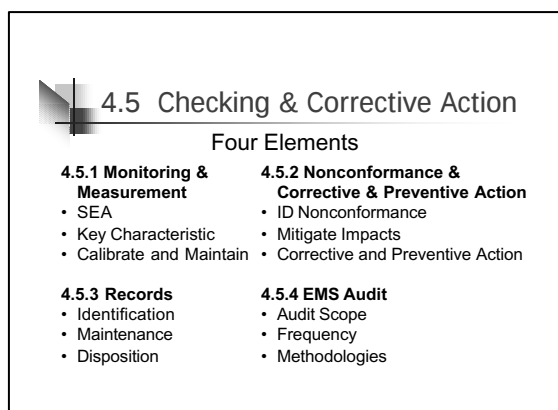
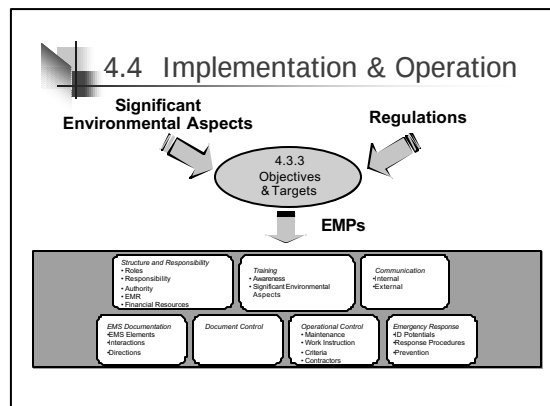
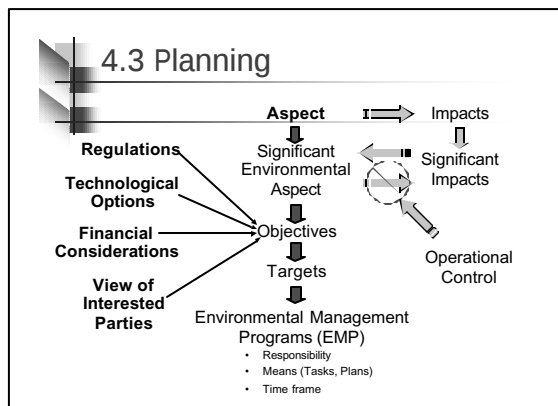
- Legal requirement
- Necessarily oriented toward Occupational Safety and Health
- A performance standard
- An attempt to immediately address every potential environmental impact
- A static system
- Something a consultant can do for you

The ISO 14001 EMS Model



Elements of an EMS





Defining an Appropriate Scope

Consider for example:

- Boundaries of permits or approvals
- Extent of authority to which environmental policy applies
- Extent of authority to allocate resources

Gap Analysis

- It is a set of questions or prompts that represent the requirements of an effective EMS
- It should identify existing system components that should be further integrated
- It should identify specific needs and areas for improvement

Gap Analysis

Facility Name:	Date:	Assessor(s):			
EMS Requirement	Yes	No	NA	Findings/Remarks	Closed
Module 2: Structure & Responsibility					
Facility has defined the roles, responsibilities, and authorities to facilitate an effective EMS.					
Facility management has appointed an EMR with defined roles and responsibilities to implement the EMS.					
Facility EMR reports on the performance of the EMS to top management for review and continuous improvement.					
Module 3: Environmental Policy					
Top management has defined the facility's environmental policy.					
Policy is specific to facility and is appropriate to the nature, scale and environmental impacts of its activities, products or services.					
Policy includes a commitment to continuous improvement in environmental performance and the prevention of pollution.					
Policy includes a commitment to sharing information on EMS performance with the community.					

NA: Not applicable
Closed: Indicates completion
EMS: Environmental Management System
EMR: Environmental Management Representative
CFT: Cross functional team
SEA: Significant environmental aspect
EPAR: Emergency Preparedness and Response
CPAN: Corrective and Preventive Action Notice

Worksheet for Persons Responsible for EMS Implementation

Roles	Individual(s) Responsible	% of Time Designated	Budget
EMR with responsibility for implementing the EMS (in small businesses, this could be the owner).			
EMS Coordinator			
EMS Team Participants (CFT)			
Conduct gap analysis.			
Identify and determine significance of environmental aspects.			
Identify and determine applicability of legal and other requirements			
Address competency-based training.			
Address operational controls.			
Implement emergency preparedness and response.			
Monitoring and measurement of "key characteristics" of operations and activities that can have significant environmental impacts (i.e., the "significant environmental aspects").			
Periodically evaluate environmental compliance.			
Handle and investigate non-conformance with the EMS.			
Address records management.			
Implement internal EMS audits.			
Contact Person:			Date Completed:

Areas Where Level of Effort Could Be Significant

- Aspect gathering and significance determination
- Developing procedures and work instructions
- Awareness training—each employee

How Birds See the World



Far Side, Gary Larson

EMS

Looking at everyday things from a different perspective

Module 2

Structure and Responsibility

Your EMS Checklist for Structure and Responsibility



- Designated an EMR and have letter of appointment signed by top management
- Designated an EMS Coordinator (if separate from EMR as recommended)

Your EMS Checklist for Structure and Responsibility



Selected CFT members who represent their departments, comprise broad expertise, and assists in:

- Identifying aspects and determining significance
- Setting objectives and targets
- Implementing environmental management programs
- Reviewing and tracking EMS internal audits results
- Cascading EMS information throughout the organization

Your EMS Checklist for Structure and Responsibility



Begun to address other important roles:

- Internal Audit Team
- Department Managers
- Area Supervisors
- Document and Record Administrator
- Quality Management System Coordinator

Your EMS Checklist for Structure and Responsibility



Making plans to:

- Include EMS responsibilities on everyone's job description
- Make meeting EMS objectives and targets a factor in performance evaluations
- Reward individuals who help the company meet EMS objectives

Your EMS Checklist for Structure and Responsibility



Making plans to:

- Structure accounting and financial functions to track true total cost of environmental issues
- Relate true cost of waste and non-compliance back to production units and make supervisors accountable

- 

Appendix E — 12

Identifying Aspects and Determining Significance

Provide a comprehensive basis and linkage to:

- Objectives and targets
- Operational controls and EMPs
- Monitoring and measurement requirements
- Training needs

Aspect Identification: Subdividing the Facility

- Appropriate balance between information glut and information gaps
- Appropriate for fostering ownership and local control

Aspect Identification: Who Should Do It?

Consider using small teams that include:

- Environmental staff (provide expertise and consistent approach)
- Department/area representatives (provide knowledge of the process and serve as information conduit)

Aspect Identification: What To Do?

- Inspect Each Process/Activity
- Create Process Flow Diagrams That Consider All Inputs
 - Energy Use
 - Water Use
 - Supplies/Disposables
 - Chemicals

Aspect Identification: What To Do? (Cont)

Create Process Flow Diagrams That Consider All Outputs

- Air Emissions
- Noise/Odor/Radiation
- Wastes
- Water Discharge
- Storm Water Discharge
- Spillage and Other

Aspect Identification: What To Do? (Cont)

Create Process Flow Diagrams That Consider All Situations

- Normal Operation
- Start Up
- Shut Down
- Emergency Situations
- Decommissioning
- Estimate Quantities (with available information)

Aspect Identification Form

Process/Company Form		Aspect/Process		Risk	
ASPECTS IDENTIFICATION TABLE		IMPACTS TO THE ENVIRONMENT TABLE		RISK TO THE ENVIRONMENT TABLE	
Category/Aspect	Impact/Process/Output/Activity	Severity	Probability	Severity	Probability
Energy Usage					
Water Usage					
Supplies/Disposables					
Chemicals					
Waste Production					
Waste Disposal					
Waste Recycling					
Waste Landfill					
Waste Incineration					
Waste Other					

Determining Significance

One Option:

- Legal Requirements/Voluntary Commitments/Company Policy
- Community Concerns
- Pollution Prevention Potential
- Potential Impact to the Environment (see also App. E)
 - Toxicity (characterization of materials and wastes)
 - Amounts (volume/mass of emissions, waste, or releases)
 - Amounts (consumption of renewable/non-renewable resources)
 - Frequency of episodes
 - Severity of actual or potential impacts

Determining Significance (Cont'd.)

Second Option:

- Legal and Other Requirements
- Company Policy
- Environmental Significance
 - Scale
 - Severity
 - Probability
 - Duration
- Business Significance
 - Effect on public image
 - Outcome of change on process
 - Concerns of interested parties
 - Cost of changing impact

Exhibit D-1: Significance Determination for Aspects Based on Environmental and Business Considerations

Process/Company Form	Aspects Not Meeting Regulatory or Facility Policy Criteria	Potential Impacts	Level of Control	Environmental Significance (Scale of 1-5 per Definition)	The Business Significance (Scale of 1-5 per Definition)
				Severity Probability Duration Average Score	Impact Public Image Process Concerns of Interested Parties Cost of Changing Impact Average Score
INPUTS					
Product Input:					
Energy Usage:					
Water Usage:					
Supplies/Disposables:					
Chemicals:					
NON-PRODUCT OUTPUTS					
Point Source Air Emissions:					
Fugitive Air Emissions:					
Secondary Air Emissions:					
Process Wastewater Discharge:					
Storm Water Discharge:					

Definitions To Be Used In Rating Environmental And Business Considerations

PARAMETER	1	2	3	4	5
ENVIRONMENTAL ACCUMULATIONS					
SCALE	negligible volume/frequency	low volume/frequency	moderate volume/frequency	high volume/frequency	very high volume/frequency
SEVERITY	minimal impact	moderate impact but localized & easily controlled	moderate impact over multiple facilities	significant impact and/or scattered by other parties	extreme impact and/or scattered by other parties
PROBABILITY	very unlikely	unlikely during abnormal/emergency conditions	occasional/unlikely during normal operations	likely during major new projects	likely during normal operations
DURATION	very short-term	short-term	moderate-term	long-term	very long-term
BUSINESS CONSIDERATIONS					
DIFFICULTY OF CHANGING IMPACT	easy to accomplish	moderate effort required	moderate effort required	major effort required	impact cannot be changed only managed
EFFECT ON PUBLIC IMAGE/REPUTATION	minimal	moderate public concern	moderate public concern	moderate public concern	extreme public concern
OUTCOME OF CHANGE ON INTERESTED PARTIES	minimal effect	moderate effect	moderate effect	large effect	extremely large effect
CONCERN OF INTERESTED PARTIES	no concerns	minor concern at local level	moderate concern throughout facilities, local, but not global	major concern at federal level	extreme concern throughout facilities, local, but not global
COST OF CHANGING IMPACT	extreme greater than \$500k	moderate greater than \$500k	moderate greater than \$500k	moderate greater than \$500k	moderate greater than \$500k

LEGEND
Interested parties could include:
• Employees
• Community
• Federal Agencies
• State Agencies
• Local Agencies
• Shareholders
• Special Interest Groups
• Other Parties

Your EMS Checklist for Environmental Aspects

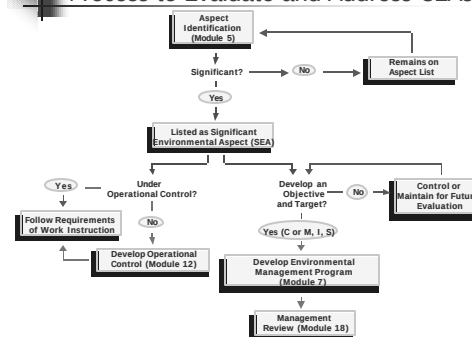


- Procedure for Identification of Environmental Aspects and Determination of Significant Aspects (incl. frequency of review)
- Documented Aspects Lists
- Documented Rationale for Significance Determination

Module 6

Objectives and Targets

Process to Evaluate and Address SEAs



Definitions (per ISO 14001)

Environmental Objective

Overall environmental goal, arising from the environmental policy, that an organization sets itself to achieve and which is quantified where practicable.

Environmental Target

Detailed performance requirement, quantified where practicable, applicable to the organization or parts thereof that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives.

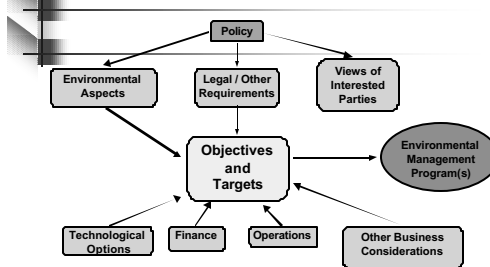
Objectives Can Focus on

- Performance, based on achieving:
 - Direct reduction or elimination of impact to environment
 - A number, percentage, quantity
- System, based on achieving:
 - Improvement to the system
 - Indirect reduction or elimination of impact to environment

Three Types of Objectives

- Control or Maintain
 - Compliance with rules and regulations
 - Keep spray painting equipment operating in accordance with good operating practice
- Improve
 - Reduce energy use
 - Increase paper recycling
- Study or Investigate
 - Investigate alternate chemicals for cleaning

Considerations



- | Objectives | | Targets | |
|------------------------|---|--|--|
| PCB Elimination | <ul style="list-style-type: none"> Remove PCBs(containing transformers and ballasts) | <ul style="list-style-type: none"> Remove all remaining PCBs(containing transformers by January 2006 Remove all remaining PCBs(containing as encountered when service is required | |
| | | <i>(See Example 7.5. EMP for PCB Elimination)</i> | |
| Spills | <p>Reduce occurrence of spills</p> | <p>Reduce spill occurrence by 10% by January 2004 by a sub-team of the CTE conducting a root cause analysis of spills during 2001 that will be incorporated into a new training program and conducting the following training:</p> <ul style="list-style-type: none"> Spill prevention awareness training for all plant personnel by July 2004 In-depth spill prevention training for all new material handling personnel by July 2004 Spill control training for all production personnel by August 2004 | |

[illegible]

Objectives		Targets
Chemical Inputs		
• Incentive use of non-hazardous chemicals by suppliers	• Incentive use of suppliers that provide alternative chemicals by 15% by January 2005	
Energy and Water Usage		
• Reduce energy and water use	• Reduce energy use by 10% per 100 man-hours from 2002 levels by January 2005 • Reduce water use per 100 man-hours from 2002 levels by January 2005 (See <i>Example 5-2: EMP for Energy and Water Use Reductions</i>)	
Point Sources and Fugitive Air Emissions		
• Reduce air emissions	• Reduce permitted air emissions by 10% by January 2005, relative to year 2002 baseline (See <i>Example 5-2: EMP for Reduction of Permitted Air Emissions</i>)	
Process Water Discharge		
• Optimize wastewater treatment to minimize chemical treatment	• Complete study by December 2004 (See <i>Example 5-4: EMP for Process Wastewater Treatment Optimization</i>)	
Storm Water Discharge		
• Improve storm water discharge quality	• Investigate improvements in storm water collection and filtration system by January 2005 • Investigate effectiveness of additional best management practices by January 2005	
Hazardous and Non-hazardous Wastes		
• Reduce hazardous and non-hazardous waste	• Reduce hazardous chemical waste by volume by 10% relative to 2002 volume by January 2005 • Reduce hazardous filter waste by weight by 5% relative to a 2002 baseline by January 2005 • Reduce process sludge waste by weight by 5% relative to a 2002 baseline by January 2005 • Reduce plastics and foam waste by weight by 10% relative to a 2002 baseline by January 2005 • Study plastic drum reduction - Complete study by January 2005 (See <i>Example 5-4: EMP for Hazardous and Non-hazardous Waste Reductions</i>)	

- ## Responsibility
- The Cross Functional Team (CFT)
 - Develops documented objectives for management consideration and approval
 - Includes resource needs
 - Top Management (ex., facility manager)
 - Authorizes objectives (and targets)
 - Provides adequate resources
 - Monitors progress
 - Uses normal business planning process to set and track environmental objectives and targets

Example 6-2: Identification of Objectives and Targets for Drydock Painting										
ASPECT IDENTIFICATION			SIGNIFICANCE DETERMINATION				OBJECTIVES/TARGETS			
Category/Aspect	Reason/Purpose, Action/Condition	Material/Resource/Time/Space/Other	Health	Environment	Cost	Other	Rationale for Significance (N or Nonimportance/N)	Objective & Type	Target	
Chemicals										
VOCs, Cancer	Vapors Coating (Dry-3)	Yes	Yes	Low	NA	5	Master Coating Rule, Air Permit	C. Maintain Compliance	Chipping	
VOCs, Cancer	Vapors Thinner (Dry-3)	Yes	Yes	Low	NA	5	Master Coating Rule, Air Permit	C. Maintain Compliance	Chipping	
Air Emissions: Exhaust/VOC	Applying Coating (Pro-7)	40 tons	Yes	Yes	NA	5	Master Coating Rule, permits of operation, toxic or emissions rule	1.Reduce fugitive VOCs, HAPs, and particulates	10% reduction by January 2004	
Fugitive/HAPs	Applying Coating (Pro-7)	10 tons	Yes	Yes	NA	5	Master Coating Rule, permits of operation, toxic or emissions rule	1.Reduce fugitive VOCs, HAPs, and particulates	10% reduction by January 2004	
Chips, open, fugitive particulate emissions	Applying Coating (Pro-7)	8 tons	Yes	Yes	NA	5	Master on going rule, coating permits to operate, toxic or emissions rule	1.Reduce fugitive VOCs, HAPs, and particulates	10% reduction by January 2004	
Non/Other Reductions:										
Non/Other Reductions	Applying Coating (Pro-7)	NA	No	No	Low	N	Does not meet significance criteria	NA	NA	
Other										
Uncoated Steel	Water Paints Cans (Dry-3)	2,000 barrels/year	Yes	Yes	Low	5	Waste Reduction Program	5-Study waste reduction strategy	Complete Study by April 2003	
Consumed Waste	Tires, Solids, Residues, Filter Media, Paint Interiors, Sludge, Cleaners, Washing Pads (Dry-3, Dishes (Dry-4)	NA	No	No	Low	5	Waste Reduction Program	5-Study waste reduction strategy	Complete Study by April 2003	
Water Chemicals	Water Paint and Solvent (Dry-3)	1,500 barrels/year	Yes	Yes	NA	5	RCRA (Title C)	C. Maintain Compliance	Chipping	
Solid waste, landfill	Paint Interiors, Sludge, Cleaners, Washing Pads (Dry-3, Dishes (Dry-4)	NA	No	No	Low	5	Waste Reduction Program	5-Study waste reduction strategy	Complete Study by April 2003	

Your EMS Checklist for O&T

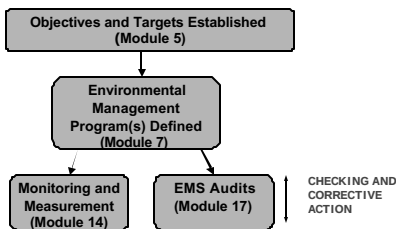


- Do you have a procedure for O&T (optional)?
- Are your O&T consistent with your environmental policy?
- Do your O&T consider (1) legal and other requirements, (2) technological options, (3) financial, operational, and business requirements and (4) the views of interested parties?
- Have you documented your O&T and assigned responsibility for meeting them?

Module 7

Environmental Management Program(s)

Environmental Management Programs



Environmental Management Programs

Action plans necessary to achieve your objectives and targets:

- Designate responsibility for achieving objectives and targets at each relevant function and level
- Establish the means and timeframe by which they are to be achieved
- EMPs can include sub-objectives and targets
- EMPs serve as "operational controls" for objectives and targets

Environmental Management Programs (cont)

- Should address:
 - Responsibilities (who will do it)
 - Tasks (what will they do?)
 - Schedules (when will they do it?)
 - Resources (what do they need to do it?)
 - Work Products (Proof that it is done)
- Should be:
 - Dynamic and revised on a regular basis

Environmental Management Programs (cont)

Suggestion for EMPs:

- For every objective of the improvement and investigate type, have a corresponding EMP
- Keep the EMPs simple and up-to-date



EMP Tools in Guide

- Form 7-1: Sample Form for EMPs (and examples 7-1 and 7-2)
- Tool 7-2: Sample Procedure for Review for New Purchases, Processes and Products
- Form 7-2: Sample form to Use with Tool 7-2

Example 7-1: EMP for Reduction of Fugitive VOC, HAP, and Particulate Emissions

Area/Department(s): Construction and Repair (see Example 5-1) - Painting
Process: Drydock Painting
Significant Environmental Aspect: Fugitive VOCs, HAPs, and particulates
Legal & Regulatory Requirement: Marine Coating Rule, permits to operate, toxic air emissions rule

Objective: Reduce fugitive VOC, HAP, and particulate emissions
Target: 10% Reduction by January 2004 (relative to year 2000 baseline)

Category: ☒ Control/Maintain ☒ Improve ☐ Study or Investigate

No. 1 Action Plan: Substitution of Raw Materials

Task/Action Items	Responsible Party	Resources Needed	Project Start Date	Project Completion Date	Comments (C)/Deliverables (D)
Identify list of suitable vendors that supply low VOCs paint	John Smith, Environmental Manager	MSDS, Paint Mfg. Assoc.	March 1, 2002	April 1, 2002	D-1. List of potential vendors of low-VOC paint
Develop evaluation of technical feasibility and cost effectiveness of select paint products.	Cross Functional Team	Testing by paint personnel, customer approval	May 1, 2002	July 1, 2002	D-2. Comparative cost analysis of select low-VOC paint application D-3. Technical feasibility analysis of select low-VOC paint application

Example 7-4(Cont'd): EMP for Reduction of Fugitive VOC, HAP, and Particulate Emissions

No. 2 Action Plan: Process Modification

Task/Action Items	Responsible Party	Resources Needed	Project Start Date	Project Completion Date	Comments (C)/Deliverables (D)
Identify process modification that can be done to reduce emissions of VOCs, HAPs, and particulates	John Smith, Environmental Manager	Eng. Dept., vendor proposals	August 1, 2002	August 31, 2002	D-1. List of potential process modification
Develop preliminary evaluation on technical feasibility and cost effectiveness of process modification alternatives	John Smith, Environmental Manager	Vendor quotes, out of reductions from support agency	September 1, 2002	September 30, 2002	D-2. Technical feasibility report of process modification alternatives D-3. Comparative cost analysis of process modification alternatives
Conduct pilot test of the preferred alternative of process modification	Kim Weinstein, Environmental Department	Process and eng. dept.	October 1, 2002	January 1, 2003	D-4. Workplan of the pilot test D-5. Weekly progress report of the pilot test D-6. Final report and recommendation
Full scale implementation	John Smith and Will Gibson (Paint Department)	Training by vendor, setting	February 2003		D-7. Quarterly progress and performance report

Your EMS Checklist for EMPs

- Have you established and maintained EMPs to achieve objectives and targets?
- Does your EMS manual provide a road map to, or include, the EMPs?
- Do you periodically review your EMPs?
- Do you have defined roles and responsibilities for environmental review of new projects or products? (example procedure in Guide)

Other Modules 8 to 18

- Implementation & Operation (8 to 14)
- Checking & Corrective Action (14 to 18)
- Management Review (18)

EMS Implementation & Operation

- Module 2: Structure and responsibility
- Module 8: Training, awareness, and competence
- Module 9: Communication
- Module 10: EMS documentation
- Module 11: Document control
- Module 12: Operational control
- Module 13: Emergency preparedness and response

Example 7-1: EMP for Energy and Water Use Reductions

Area/Department(s): Total Facility
Process: All
Significant Environmental Aspect: Energy and water use

Objective: Reduce energy and water use
Target: (1) Energy – 10% per 100 man-hours from 2002 levels by January 2006
(2) Water – 5% per 100 man-hours from 2002 levels by January 2005

Category: ☐ Control/Maintain ☒ Improve ☐ Study or Investigate

Task/Action/Item	Responsible Party	Resources Needed	Project Start Date	Project Completion Date	Comments/Deliverables
Monitor energy use	Energy Reduction Team		1/2004	Ongoing	C – Frequency of monitoring to be established by Energy Reduction Team
Purchase and distribute compressed air leak detection equipment to departments using compressed air	Engineering Department		1/2004	3/2004	D – Report monthly progress to Energy Reduction Team
Monitor compressed air leaks in relevant departments	Department Managers		3/2004	Ongoing	D – Department submit monthly report of leaks to Energy Reduction Team
Report and implement leak repair maintenance program based on monitoring results	Central Maintenance Area Manager		3/2004	Ongoing	D – Central Maintenance submits monthly summary of maintenance activities to Energy Reduction Team
Study feasibility of energy reduction by redesigning ventilation systems	Engineering Department		6/2004	10/2008	D – Submit findings to Energy Reduction Team by 10/15/04

Example 7-1: EMP for Energy and Water Use Reductions (continued)

Task/Action/Item	Responsible Party	Resources Needed	Project Start Date	Project Completion Date	Comments/Deliverables
Submit recommendations based on study findings	Engineering Department		11/2004	12/2004	D – Present recommendations to Energy Reduction Team by 12/15/04
Implement recommendations where feasible	Engineering Department		1/2005	12/2005	D – Report monthly progress to Energy Reduction Team
Study methods to reduce water usage	Environmental Compliance		1/2004	6/2004	D – Report findings to Energy Reduction Team by 6/15/2004
Submit recommendations based on study findings	Environmental Compliance		7/2004	9/2004	D – Present recommendations to Energy Reduction Team by 9/15/2004
Implement recommendations where feasible	Engineering Department		10/2004	12/2004	D – Report monthly progress to Energy Reduction Team

Module 9: Communication

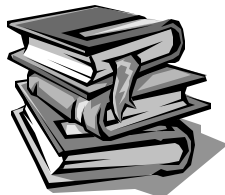


Communication

- Establish procedures to report environmental activities internally and externally
- Communicate results of EMS audits and management reviews to all employees
- Create a system for receiving and responding to concerns (internal and external)
- Be proactive



Modules 10 & 11: EMS Documentation & Document Control



EMS Documentation

- Shall establish and maintain information
- Describe the core elements of the EMS and their interaction
- Provide direction to related documents

EMS Documentation Pyramid



EMS Documentation

- Level 1 — EMS Road Map
- Level 2 — Operational/Management Procedures
- Level 3 — Working Instructions (Specific how-to Procedures)

Effective Use of Words

Lord's Prayer	54 words
The Gettysburg Address	286 words
Ten Commandments	297 words
American Declaration of Independence	300 words
The Declaration of Independence	1,322 words
EEC Directive on Export of Duck Eggs	26,911 words
Government regulations on sale of cabbage	27,000 words

What EMS Documents Need To Be Controlled?

- ISO 14001 documents
- Emergency Preparedness and Response Documents
- Operational Controls
- Significant Environmental Aspects
- Which internal documents?
- Which external documents?

Module 12: Operational Controls

- Should be associated with significant environmental aspects and stipulate operating criteria
- Are documented procedures to cover situations where their absence could lead to a deviation from the environmental policy and the objectives and targets

Operational Control Example

For storage of materials and wastes, prevent releases by having defined procedures and work instructions for:

- Loading and unloading
- Container integrity
- Material compatibility
- Secondary containment
- Prevention of storm water contact

Operational Control Example

See handout for example of an Environmental Operating Procedure/Work Instruction for Hazardous Waste Satellite Accumulation Areas that is in addition to one in the Implementation Guide for Control of Coating and Thinner Use

Link Between SEAs and Operational Controls

Significant Aspect	Objective	Target	Operational Control
Peak inventory peak 2L	Control volatile emissions	Control	• Following work sampling checklist procedure • Peak application and collection (PAC) • Full storage 10% and implementation 10%
Peak stored emissions of VOCs	1. Reduce VOC emissions	10% by January 2002	• VOC reduction IDMP
Waste water from manufacturing process	1. Manage the potential for emissions	Control by January 2002	• Solid waste and emissions IDMP

Example 12-2: Operational Control for Container Labeling (EWI-001)

- 0.0 Purpose**
To maintain safety on-site and ensure that, in the event of a spill of a hazardous or non-hazardous substance, the Emergency Coordinator follows the correct procedure.
- 1.0 References**
1.1 RCRA Subtitle C (40 CFR 262)
- 2.0 Responsibility**
2.1 The Environmental Engineer or designee shall ensure that [Facility's Name] makes available labels for container labeling and ensures that employees who handle and dispose of hazardous and non-hazardous wastes understand the labeling procedures outlined here.
2.2 Managers of each department are responsible for providing the Environmental Engineer with a list of employees who handle or may potentially handle hazardous and nonhazardous wastes.
- 3.0 Procedure for Labeling Containers:**
3.1 All containers of hazardous and non-hazardous substances should have a label. The label should include, at a minimum:
3.1.1 Chemical name
3.1.2 Hazard warning
3.1.3 Date
3.1.4 User department
3.2 All labels must be legible and written with a permanent marker.
3.3 Labels that have been damaged or removed must be replaced.
3.4 If a chemical is transferred to a portable or temporary container, then that container must also have a label.
3.5 If a chemical is flammable, an additional "DANGER-FLAMMABLE" label is required.

Approved by:

Environmental Management Representative

Tool 12-2: Sample Worksheet for Determining Which Operations or Activities Require Operational Controls

Operation or Activity with SEA to be Controlled	Procedure is Needed		No procedure is needed
	And Must Be Developed	Procedure Exists, but Must Be Documented	Exists and Is Documented

Module 13: Emergency Preparedness and Response

- Establish a procedure and controls to respond to unexpected or accidental incidents
- Should address:
 - Accidental emissions to the atmosphere
 - Accidental discharges to water and land
 - Specific environmental and ecosystem impacts from accidental releases

Checking and Corrective Action

- Module 14: Monitoring and measurement
- Module 15: Non-conformance and corrective and preventive action
- Module 16: Records
- Module 17: EMS audit

Module 14: EMS Monitoring and Measurement



“What gets measured gets managed; and what gets managed gets done”

Monitoring and Measurement

Monitor and measure actual performance

↓
Compare against objectives and targets

↓
Determine areas of success

↓
Identify activities requiring corrective action and improvement

Monitoring and Measuring Improvements

Measuring pollution discharges



Measuring efficiency at process or production level



Example 14-1: Example of Links Between Aspects, Objectives and Targets, Operational Controls, and Monitoring and Measurement

Significant Aspect	Objective	Target	Operational Control	Monitoring and Measurement
Point Source Particulate Air Emissions	C-Maintain compliance	Ongoing	- Title V Permit - Continuous Collector O&M	- Prevent dirty monitoring log - Compliance audit - Regulatory reporting - EMS audit
Hazardous Waste	I-Reduce hazardous waste	99% by January 2005	Hazardous Waste-reduction EMP	- Hazardous waste volume reduction tracking metric - EMS audit
High Volume-Low Toxicity Waste	S-Investigate potential for reduction	Complete study by January 2005	Waste reduction EMP	- Waste-reduction tracking metric - EMS audit

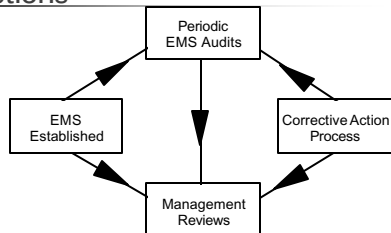
Goals for Monitoring and Measurement

- Tie to the business goals
- Make the metrics meaningful to top management
- Make the metrics understandable to the non-environmental audiences, both inside and outside of the company
- Tie to existing business metrics
- Use data already collected

Module 15: Corrective and Preventive Action and Records

- Establish procedures for handling non-conformance, mitigating any impacts caused, and initiating corrective action
- Establish procedures for maintaining records of training, audits, and reviews

EMS Audits and Corrective Actions



Module 17: EMS AUDIT

THE THREE C'S OF AUDITING AN EMS TO 14001 CONFORMANCE

Meets the requirements (implements the "shall")

CONSISTENCY

Various elements inter-related (i.e., significant aspects reflected in emergency planning, etc.)

CONTINUAL IMPROVEMENT

Mechanisms in place to improve (including fixing non-conformances

and improving performance)

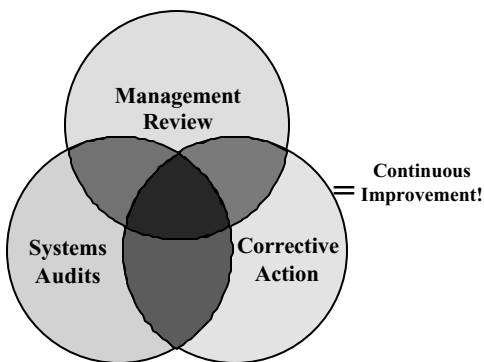
* You must audit the EMS for ALL three C's!

EMS Audits

- Use audits to identify performance improvement opportunities
- Select prescriptive, descriptive, and TQM approaches
- Schedule audit during production
- Talk to production/process staff

Continual Improvement

- Continual evaluation of the environmental performance of the EMS against:
 - Objectives and targets
 - The Policy for the purpose of identifying opportunities for improvement



Module 18: Management Review

- Top management should regularly review the EMS
 - Determine suitability, adequacy, and effectiveness
 - Evaluate EMS in terms of financial performance and competitive position
 - Address possible need for changes to policy, objectives, and other elements of EMS
- Goal is to improve overall environmental (and business) performance!



SECTION 2

LAUNCH AND IMPLEMENTATION TOOLS

This section of the workbook contains documents useful in launching ISO 14001 activities. In particular the following documents are included:

- Launch Guidance Document
- EMS Development & Implementation Flowchart
- EMS Development & Implementation Schedule
- EMS Management Review Meeting forms

The Launch Guidance Document provides information and tools to those responsible for obtaining management commitment at the facility level to implement ISO 14001. Prior knowledge of ISO 14001 requirements by those using this document is assumed.

The EMS Development & Implementation Flowchart and Schedule are complementary documents that can be used to describe the path for implementing ISO 14001 and the main activities necessary for successful implementation. The schedule assumes a ten (10) month period to develop & implement ISO 14001 prior to registration.

The EMS Management Review Meeting forms are templates that can be used by facility management to periodically review development & implementation activities prior to registration. It is important that all management review meetings be documented to demonstrate management involvement in the system.

ISO 14001 Environmental Management System

Launch Guidance Document

This document pertains to those responsible for obtaining management commitment to implement an ISO 14001-based environmental management system

Table of Contents

1. Management meeting launch guidance
2. Management review meeting generic agenda
3. Management meeting announcement
4. Sample memorandum on the implementation of a new environmental management system based on ISO 14001
5. Sample Cross Functional Team roles and responsibilities

Management Meeting Launch Guidance

- Meeting will be conducted by those responsible for obtaining management commitment to implement an ISO 14001-based system
- Schedule meeting when all members of the Management Team can attend, especially the Facility/Plant Manager
- Coordinate meeting so that appropriate Corporate and Division representatives can attend
- Schedule meeting for at least one hour to allow sufficient time to cover all the material

Scheduling

- Review Management Team schedule's to ensure full attendance
- Distribute meeting announcement if necessary (see attached)

Meeting Room Setup

- Overhead projector
- Podium and microphone if required or available
- Flip chart and markers

Meeting Material - presentation material provided by presenters

- Power point presentation materials
- Environmental management system development & implementation flowchart
- Management review meeting #1 agenda
- Draft commitment memorandum

***Facility/Plant Name* Environmental Management System Management Review Meeting #1**

Date: _____

Location: _____

Attendees: See sign-in sheet

<u>Agenda Topics</u>	<u>Time</u>	<u>Responsibility</u>
1. Introduce ISO 14001 Elements and Management Responsibilities		
2. Review Development & Implementation Flowchart		
3. Designate Environmental Management Representative & establish Cross Functional Team (CFT)		
4. Review Draft Commitment Memorandum		

<u>Agenda Topics</u>	<u>Discussion Topic</u>	<u>Required Documentation</u>
1. Introduce ISO 14001 Elements and Management Responsibilities	• ISO 14001 background including similarities to ISO 9001/2 & QS 9000 • Review presentation overheads & explain management responsibilities	• Attendance sign-in sheet
2. Review Development & Implementation Flowchart	• Discuss the implementation strategy	• Meeting minutes reflecting endorsement of implementation plan
3. Designate Environmental Management Representative & Establish Cross Functional Team (CFT)	• Roles & responsibilities of environmental management representative • Selection of EMR	• Meeting minutes identifying EMR
4. Review Draft Commitment Memorandum	• Issuance of memorandum from facility/plant manager committing implementation of ISO 14001 and announcing EMR	• Signed memorandum

Meeting Announcement

Attendance List : *(list names of attendees)*

Meeting date and time: *(identify date and time of meeting)*

Announcement

A Management Team meeting has been scheduled to review and discuss the ISO 14001 Environmental Management System standard, and to obtain your commitment for implementing this system. ISO 14001 is a voluntary international standard that will help establish a common environmental baseline across all our facilities. It will also help improve our overall environmental performance, thus assuring a safe environment for our children and future generations.

Meeting Agenda

1. Introduce ISO 14001 Elements and Management Responsibilities
2. Review Development & Implementation Flowchart
3. Designate Environmental Management Representative & Establish Cross Functional Team
4. Review Draft Commitment Memorandum

Memorandum

Date: (Date)

To: (Facility/Plant Management)

From: (Facility/Plant Manager Name)

Subject: Implementation of a New Environmental Management System Based on ISO 14001

Over the next several months the (Facility/Plant Name) will be implementing a new Environmental Management System (EMS) based on the ISO 14001 international environmental standard. The fundamental goal of this voluntary international standard is continual improvement in our environmental performance as measured by the types and amounts of wastes and discharges we create. This increased environmental stewardship will help ensure a safe environment for our children and future generations.

In order to support this new initiative, I am designating (named individual) as the Environmental Management Representative for the (Facility/Plant Name). In this capacity, (named individual) will be responsible for coordinating the actions needed to meet the environmental requirements of the ISO 14001 standard, as well as those of the company. (named individual) will also periodically report implementation progress to Plant Management.

To ensure adequate resources for developing and implementing the new EMS, I have asked (named individual) to assemble and direct a standing cross-functional team. This team will have representatives from most plant functions and activities. Team responsibilities may include evaluating current systems and documents for potential inclusion in the EMS, developing an environmental policy, identifying wastes and discharges associated with our operations and determining appropriate tracking metrics, assuring that regulatory compliance requirements are met, and, in general, creating all required system documents and processes.

We will be obtaining certification to the ISO 14001 standard by an independent, accredited Registrar. I would like our new EMS be fully implemented in sufficient time to allow the certification process to begin by (Date). I, therefore, request your full support in attaining this goal.

CROSS FUNCTIONAL TEAM Roles & Responsibilities

Team Membership

The Cross Functional Team (CFT) should include representation from most functional and process/work areas. In addition to the Environmental Management Representative, typical representation may include:

- Production
- Maintenance
- Human Resources
- Safety
- Engineering
- Material Handling
- Quality
- Controller's Office
- Environmental Engineers
- Training

Environmental Management Representative Roles & Responsibilities

The Environmental Management Representative is a member of the Management Team and has the primary direct responsibility and authority to develop and implement the Environmental Management System, including managing the overall project, reporting progress to the facility manager, scheduling periodic reviews by the Management Team and chairing the Cross Functional Team.

Team Member Roles & Responsibilities

CFT members must be motivated and willing to undertake the responsibilities, time commitment and opportunities involved in developing and implementing the EMS at the facility. They should also have access to their respective Area or Department Manager to assure that:

- area/department environmental aspects are identified,
- objectives and targets are consistent area/department goals,
- area/department procedures and work instructions are complete, accurate and implemented, and
- employee awareness and job specific training are completed

Due to the linkages between ISO 14001 and ISO 9001/2 including Document Control, Records, Structure and Responsibility, Management Review, Internal Audits, etc., it is strongly recommended that the Cross Functional Team include representation from the Quality Department as well as others closely involved in the development and implementation of the ISO 9001/2 system.

The Cross Functional Team will have responsibility for EMS development including:

- Developing a facility specific environmental policy
- Identifying environmental aspects
- Evaluating aspect significance
- Developing objectives and targets
- Creating environmental management programs
- Detailing operational control requirements
- Directing training resources
- Implementing an internal auditing system

The Cross Functional Team will also be the primary ISO 14001 communications link to area and department personnel. CFT members will need support from areas and departments in developing procedures and work instructions, maintaining documents and records, and training all facility employees.

There will be frequent CFT meetings of 1-3 hour's duration and assignment of responsibilities between meetings, continuing until the certification audit. The CFT is to document its meetings with agendas, attendance sign-in lists and minutes indicating decisions and recommendations concerning environmental management system development and implementation.

Typical Area/Department Activities and Assignments

Facility/Plant Manager

- Overall responsibility for development and implementation of the environmental management system.
- Allocation of resources for implementation and training.

Controller's Office

- Assure financial considerations are addressed in preparing projects, in reviewing projects, and planning.

Department/Area Manufacturing Areas

- Develop and implement area specific procedures and/or work instructions to minimize environmental releases and comply with regulatory requirements.
- Develop procedures and/or work instructions for start-up, shut-down and other non-routine operating conditions.
- Support resource availability for awareness training and job specific training.

Materials Handling

- Develop and implement procedures and/or work instructions to reduce the risk of spills or releases to the environment.
- Develop and implement internal waste management procedures and/or work instructions.

Employee Relations/Human Resources -- Training, Security & Safety

- Develop training needs analyses and plans.
- Implement employee awareness and job specific training.
- Maintain environmental training records.
- Coordinate development and implementation of emergency procedures including procedures to control spills and releases.

Maintenance Operations

- Develop and implement procedures and/or work instructions to assure proper calibration of control and monitoring instrumentation.
- Develop and implement procedures and/or work instructions to maintain environmental control equipment.

Engineering/Environmental Coordinator

- Assure technological and technical options reviewed and considered in establishing objectives and targets.
- Develop and implement procedures and/or work instructions to assure that necessary permit, license and other regulatory approvals are identified during project development.
- Facilitate CFT meetings on behalf of EMR when appropriate.
- Manage and maintain facility compliance assurance program.

Facility/Plant Name Environmental Management System
Management Review Meeting #2

Date: _____

Location: _____

Attendees: See sign-in sheet

<u>Agenda Topics:</u>	<u>Time</u>	<u>Responsibility</u>
1. Cross Functional Team Training		
2. Environmental Aspects		
3. Significant Aspects		
4. Objectives & Targets		
5. Environmental Policy		
6. Environmental Management Programs		

<u>Agenda Topics</u>	<u>Discussion Topic</u>	<u>Required Documentation</u>
1. Cross Functional Team Training	• Status of CFT training • Agreement on roles & responsibilities for development & implementation of EMS	• Meeting minutes reflect current status of training • Meeting minutes reflect agreement for roles and responsibilities for development & implementation
2. Environmental Aspects	• Review aspects identified for the facility	• Meeting minutes reflect concurrence by management of the identified aspects
3. Significant Aspects	• Review significant aspects and rationale for decision • Discuss external communications for significant environmental aspects	• Meeting minutes reflect concurrence by management of identified significant aspects • Meeting minutes reflect decision by management on external communication of significant aspects
4. Objectives & Targets	• Review objectives & targets for significant aspects that have been identified	• Meeting minutes reflect concurrence by management of identified objectives & targets • Meeting minutes reflect a commitment of resources (human and economic) by management to meet objectives by the targeted dates
5. Environmental Policy	• Review environmental policy	• Meeting minutes reflect policy approval
6. Environmental Management Programs	• Review programs to ensure linkage with objectives & targets	• Meeting minutes reflect approval of programs and corresponding resources & time frames

Facility/Plant Name Environmental Management System Management Review Meeting #3

Date: _____

Location: _____

Attendees: See sign-in sheet

<u>Agenda Topics</u>	<u>Time</u>	<u>Responsibility</u>
1. Facility Procedures		
2. Work Practices		
3. Training Needs Analysis		
4. Roles & Responsibilities		
5. System Documentation		

<u>Agenda Topic</u>	<u>Discussion Topic</u>	<u>Required Documentation</u>
1. Facility Procedures	Review that system procedures have been developed to conform to ISO 14001	Meeting minutes reflect that management has concurred on the development of system procedures
2. Work Practices	Review that work practices have been developed for specific activities or processes	Meeting minutes reflect that management has concurred on the development of work practices
3. Training Needs Analysis	Review training requirements for individuals whose job functions affect the operation of the EMS	Meeting minutes reflect management concurrence with training needs analysis
4. Roles & Responsibilities	Review roles & responsibilities of those required to maintain and improve the system	Meeting minutes reflect management concurrence
5. System Documentation	Review EMS manual to verify system documents linked to ISO 14001 elements	Meeting minutes reflect management's approval of EMS manual

Facility/Plant Name Environmental Management System
Management Review Meeting #4

Date: _____

Location: _____

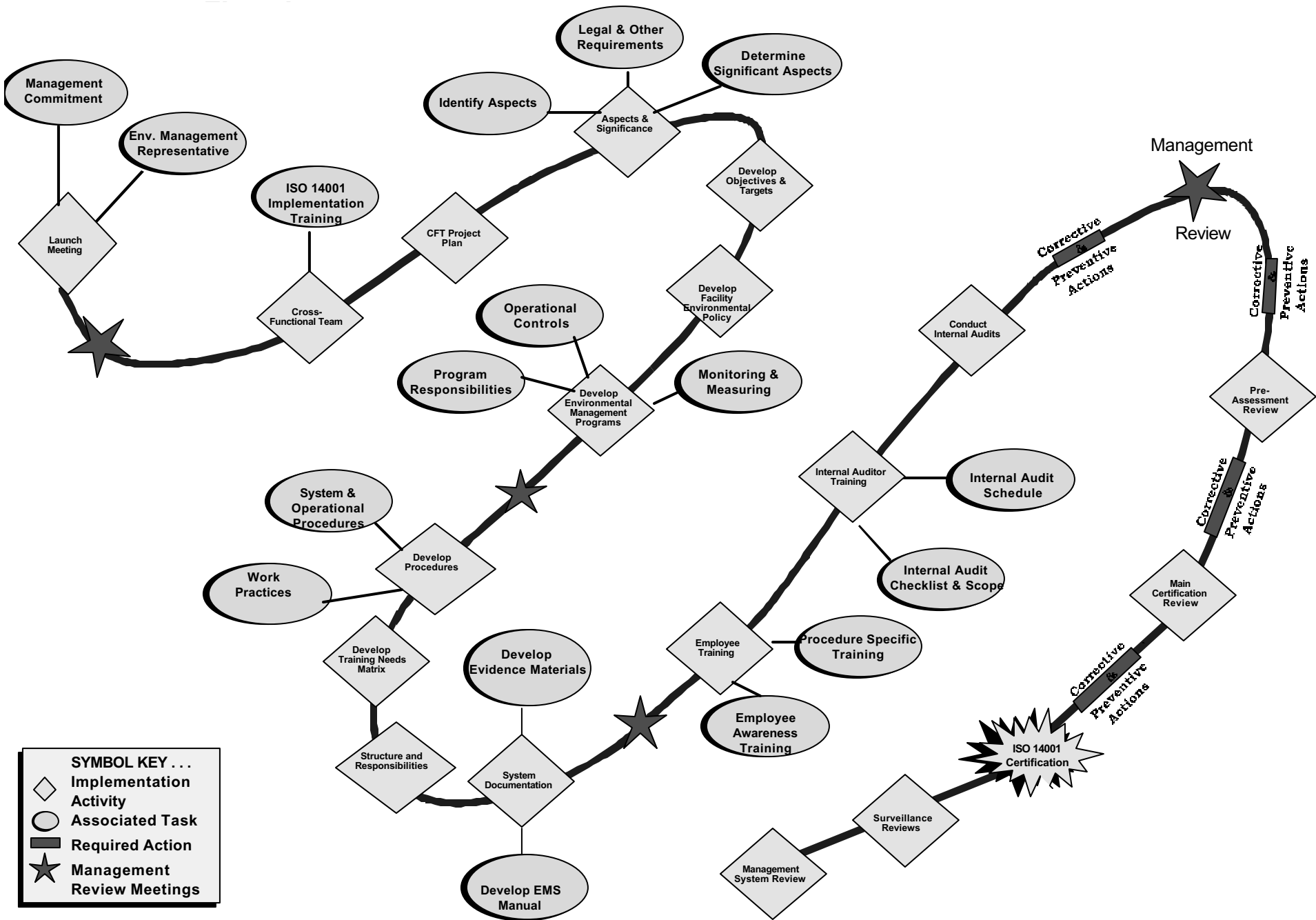
Attendees: See sign-in sheet

<u>Agenda Topics</u>	<u>Time</u>	<u>Responsibility</u>
1. System Training		
2. Internal Audits		
3. Corrective and Preventive Actions		
4. System Management Review		

<u>Agenda Topics</u>	<u>Discussion Topic</u>	<u>Required Documentation</u>
1. System Training	• Status of employee awareness training • Status of procedure/work practice training • Status of internal auditor training	• Meeting minutes reflect current status of training
2. Internal auditing	• Review internal audit schedule • Status of internal audit observations	• Meeting minutes reflect current status of internal audits
3. Corrective and Preventive Actions	• Status report on corrective and preventive action plans	• Meeting minutes reflect concurrence by management on corrective and preventive action plans
4. System Management Review	• Review total status of Environmental Management System to ensure continuing suitability, adequacy and effectiveness	• Meeting minutes reflect details of environmental management system review and materials or information presented

ISO 14001 RESOURCES

Environmental Management System Development & Implementation



EMS Development and Implementation Schedule for Specialty-Batch Chemical Manufacturers

Task Name	Duration	Start	Finish	Jan '02	Feb '02	Mar '02	Apr '02	May '02	Jun '02	Jul '02	Aug '02	Sep '02	Oct '02	Nov '02	Dec '02	Jan '03	Feb '03	Mar '03
EMS Planning	140 days	Mon 1/14/02	Fri 7/26/02															
Attend 1.5-Day Training on EMS Planning	2 days	Mon 1/14/02	Tue 1/15/02															
Module 1, 2 & 3: Laying the Groundwork, Roles, Policy	25 days	Fri 1/25/02	Thu 2/28/02															
Gap Analysis	2 wks	Fri 1/25/02	Thu 2/7/02															
EMS Coordinator, EMR, CFT Roles, Budget Worksheet	1 wk	Fri 2/8/02	Thu 2/14/02															
Facility Implementation Schedule	1 wk	Fri 2/15/02	Thu 2/21/02															
Working Draft of Environmental Policy	1 wk	Fri 2/22/02	Thu 2/28/02															
Module 4: Legal & Other Requirements	10 days	Fri 3/1/02	Thu 3/14/02															
Legal & Other Requirements Procedure	1 wk	Fri 3/1/02	Thu 3/7/02															
Legal & Other Requirements Matrix	1 wk	Fri 3/8/02	Thu 3/14/02															
Module 5: Environmental Aspects	35 days	Mon 4/15/02	Fri 5/31/02															
Lists of Aspects & Significant Environmental Aspects	6 wks	Mon 4/15/02	Fri 5/24/02															
Aspects Procedure	1 wk	Mon 5/27/02	Fri 5/31/02															
Module 6 & 7: Objectives and Targets and EMPs	20 days	Mon 6/3/02	Fri 6/28/02															
Documented Objectives & Targets	2 wks	Mon 6/3/02	Fri 6/14/02															
Documented EMPs	2 wks	Mon 6/17/02	Fri 6/28/02															
Hold On-Site Support Visits	15 days	Mon 6/17/02	Fri 7/5/02															
West Coast Yards	1 wk	Mon 7/1/02	Fri 7/5/02															
Gulf Coast Yards	1 wk	Mon 6/24/02	Fri 6/28/02															
East Coast Yards	1 wk	Mon 6/17/02	Fri 6/21/02															
Module 10 & 18: EMS Doc. & Interim Management Review	20 days	Mon 7/1/02	Fri 7/26/02															
Revised Policy	1 wk	Mon 7/1/02	Fri 7/5/02															
Org Chart, Descriptions of EMS Roles, Letter Designating EMR	1 wk	Mon 7/8/02	Fri 7/12/02															
Draft of EMS Manual	2 wks	Mon 7/15/02	Fri 7/26/02															

Project: Specialty-Batch Chemical
Date: October 30, 2003

Task



Summary



Rolled Up Progress



External Milestone



Split



Rolled Up Task



External Tasks



Deadline



Progress



Rolled Up Split



Project Summary



Milestone



Rolled Up Milestone



External Milestone



EMS Development and Implementation Schedule for Specialty-Batch Chemical Manufacturers

Task Name	Duration	Start	Finish	Jan '02	Feb '02	Mar '02	Apr '02	May '02	Jun '02	Jul '02	Aug '02	Sep '02	Oct '02	Nov '02	Dec '02	Jan '03	Feb '03	Mar '03
EMS Implementation	139 days	Tue 6/4/02	Fri 12/13/02															
Attend 1.5-Day Training on EMS Implementation (& Report Progress)	2 days	Tue 6/4/02	Wed 6/5/02															
Module 12: Operational Control	15 days	Mon 7/29/02	Fri 8/16/02															
List of Operational Controls	2 wks	Mon 7/29/02	Fri 8/9/02															
Contractor Management Procedure	1 wk	Mon 8/12/02	Fri 8/16/02															
Module 14: Monitoring & Measurement	20 days	Mon 8/19/02	Fri 9/13/02															
Monitoring & Measurement Procedure	2 wks	Mon 8/19/02	Fri 8/30/02															
Compliance Assurance Procedure	2 wks	Mon 9/2/02	Fri 9/13/02															
Module 8: Training, Awareness & Competence	20 days	Mon 9/16/02	Fri 10/11/02															
Training Procedure	2 wks	Mon 9/16/02	Fri 9/27/02															
Training Needs Analysis Matrix	2 wks	Mon 9/30/02	Fri 10/11/02															
Modules 9 (&7): Communication	15 days	Mon 10/14/02	Fri 11/1/02															
Communication Procedure(s)	2 wks	Mon 10/14/02	Fri 10/25/02															
Environmental Review of New Projects Procedure	1 wk	Mon 10/28/02	Fri 11/1/02															
Module 13 (&8): Emergency Preparedness & Response	20 days	Mon 11/4/02	Fri 11/29/02															
Emergency & Preparedness Response Procedure	2 wks	Mon 11/4/02	Fri 11/15/02															
Employee Awareness Presentation & Plan	2 wks	Mon 11/18/02	Fri 11/29/02															
Module 11 & 16: Document & Records Control	10 days	Mon 12/2/02	Fri 12/13/02															
Document Control Procedure	1 wk	Mon 12/2/02	Fri 12/6/02															
Records Procedure	1 wk	Mon 12/9/02	Fri 12/13/02															

Project: Specialty-Batch Chemical
Date: October 30, 2003

Task



Summary



Rolled Up Progress



External Milestone



Split



Rolled Up Task



External Tasks



Deadline



Progress



Rolled Up Split



Project Summary



External Milestone



Milestone



Rolled Up Milestone



EMS Development and Implementation Schedule for Specialty-Batch Chemical Manufacturers

Task Name	Duration	Start	Finish	Jan '02	eb '0	Mar '02	Apr '02	ay '0	Jun '02	Jul '02	Aug '02	ep '0	Oct '02	ov '0	Dec '02	Jan '03	eb '0	Mar '03
EMS Checking & Review	85 days	Mon 12/2/02	Fri 3/28/03															
Attend 1.5-Day Training on EMS Checking & Review	2 days	Mon 12/2/02	Tue 12/3/02															
Module 17: EMS Audit	20 days	Mon 12/16/02	Fri 1/10/03															
EMS Audit Procedure	2 wks	Mon 12/16/02	Fri 12/27/02															
EMS Audit Plan	2 wks	Mon 12/30/02	Fri 1/10/03															
Module 15: Nonconformance & Corrective and Preventive Action	10 days	Mon 1/13/03	Fri 1/24/03															
N&C&PA Procedure	2 wks	Mon 1/13/03	Fri 1/24/03															
Module 10: EMS Documentation	15 days	Mon 1/27/03	Fri 2/14/03															
Revised EMS Manual	3 wks	Mon 1/27/03	Fri 2/14/03															
Module 18: Management Review	30 days	Mon 2/17/03	Fri 3/28/03															
Internal Audit Summary	6 wks	Mon 2/17/03	Fri 3/28/03															

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Task



Summary



Rolled Up Progress



External Milestone

Split



Rolled Up Task



External Tasks



Deadline

Progress



Rolled Up Split



Project Summary



Milestone

Rolled Up Milestone

External Milestone