SectorStrategies

A Guide to Developing an Environmental Management System for Metal Finishing Facilities

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

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ACKNOWLEDGMENTS

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Contents

Introduction

This publication is intended for small business owners or employees of metal finishing facilities who have decided to do an environmental management system (EMS) for their facility or company. It is made up of two parts:

- Part I: Steps of an Environmental Management System gives an overview of the 13 steps of an EMS and includes examples you can use to start creating your own EMS.

- Part II: Sample Manual and Blank Forms includes an EMS manual for a hypothetical metal finishing facility and blank forms you can use to begin the development of your own EMS Manual. The sample manual describes an EMS that is based on the elements of the ISO 14001 standard and incorporates EPA's National Environmental Performance Track (Performance Track) emphasis on compliance, pollution prevention, and communication with your community. Your choice whether or not to build an EMS that could be certified in the future will depend on your goals and needs.

What is an Environmental Management System (EMS)?

An EMS can help your facility handle matters related to water, air, and land. Developing and carrying out an EMS is voluntary, and it reduces your facility's risk and liability, increases efficiency in using environmental resources, and helps your facility comply with environmental rules. An EMS improves performance by helping your facility:

- Reduce costs;

- Prioritize environmental issues;

- Identify potential problems;

- Improve environmental compliance;

- Use materials more efficiently;

- Streamline operations;

- Improve internal communication; and

- Enhance employee morale.

An EMS can also make your facility eligible for state and/or federal regulatory incentives. See **www.epa.gov/performancetrack** or contact your state agency for more information.

How to Use this EMS Guide

To get started, read Part I of this publication to learn about the 13 steps of an EMS and review recommendations for how your facility should create each step. Part I has the following format:

- What (describes what the step is);

- Who (identifies the person or people in charge of the step);

- Why (explains the importance of each step); and

- How (shows how to create each step).

Next, read Part II of this document, which will help you create your own EMS Manual by providing a sample EMS Manual for a hypothetical facility as well as blank forms you can use to get started. Be sure that your facility's company policies and the most recent federal, state, and local requirements are incorporated into your EMS Manual.

As you plan your EMS, keep the following things in mind:

- Focus on results. Your EMS should reduce risk and help your facility ensure total compliance, while continuously improving your environmental performance.

- Plan for flexibility. Design your EMS so it will continue to be used and adapted instead of collecting dust. Your EMS should change and improve with your business.

- Pick an appropriate level of detail. In general, the larger the facility, the more detailed its EMS procedures tend to be.

- Incorporate your existing systems. If you already have a system for documentation, for example, it may make sense to develop your EMS Manual to incorporate that system.

- Start small. Don't take on the world.

This publication is based on documents from the Texas Commission on Environmental Quality and U.S. EPA.

The Terms We Use

CFR: Code of Federal Regulations

Cross-Functional Team (CFT): The CFT is made up of members of each major operation within your facility who represent their area or department in several facets of the EMS and serve as an information resource.

Environmental Aspect: An element of your facility's activities, products, or services that can or does have an impact on the environment.

Environmental Impact: Any change to the environment, whether good or bad, resulting from your facility's activities, products, or services.

Environmental Management Representative (EMR): A member of your facility's top management who: identifies all EMS tasks and makes sure they are completed on time; reports periodically to the management group; and demonstrates top management's commitment to the EMS.

Environmental Policy: Your facility's statement of its main environmental commitments.

ISO 14001: A standard set by the International Organization for Standardization that is primarily concerned with "environmental management."

Significant Environmental Aspect (SEA): An environmental aspect that has, or potentially has a significant impact on the environment.

Nonconformity: A discrepancy between your facility's actual EMS activity and a related procedure in your EMS Manual.

Where to Find More EMS Information

If you have questions about EMS, there are many sources of information available to you. You can get information in the following ways:

On the Web:

■ Visit EPA's Web site at **www.epa.gov** for information about environmental regulations, tools, and compliance guidance. Information specifically about EMS can be found at **www.epa.gov/ems/.**

■ Visit EPA's compliance assistance Web site at **www.epa.gov/compliance/resources/publications /assistance/sectors/chemicalpub.html** for a list of EPA compliance tools.

■ Download EPA's list of environmental assistance providers for small businesses, "A Resource Directory of Small Business Environmental Assistance Providers" [EPA-233-B-02-001] March 2002, 85 pp., from **http://www.epa.gov/sbo/pubs.htm**.

■ Visit the U.S. Small Business Administration at **www.sba.gov** for information about services available to small businesses.

By phone:

■ Contact EPA's Small Business Ombudsman at (800) 368-5888 with questions about regulations and guidance, research, case studies, or for contacts for more information.

Part I: Steps of an Environmental Management System

1 Define the Scope of Your Facility's EMS and Assign Responsibilities

What

An EMS' scope is how much of a facility's activities the EMS covers. For example, the scope of your facility's EMS may be all of the operations occurring on site at the plant—from the point of entry of raw materials and energy to the point of exit of finished products. Or, your scope may extend even further to include your suppliers and contractors. EMS responsibilities should be assigned to individuals who can competently complete the tasks.

Who

While your facility's characteristics will determine who should be responsible for implementing your EMS, the following concepts are common across all facilities:

■ One person can't develop and implement the entire EMS. An EMS involves everyone.

■ Managers must reinforce the importance of EMS tasks.

■ Employees with EMS responsibilities must know that they have management support.

■ Authority and resources must be made available to employees with EMS tasks.

■ Managers should evaluate each employee's performance of their assigned EMS duties.

■ EMS assignments should be put in writing (see Sample Form 1: EMS Responsibilities, on the next page).

Select an EMS Team, made up of the following people:

■ **Environmental Management Representative (EMR):** The EMR is a member of your facility's top management who: identifies all EMS tasks and makes sure they are completed on time; reports periodically to the management group; and demonstrates top management's commitment to the EMS.

■ **EMS Coordinator:** The EMS Coordinator leads the EMS Team and ensures support for the EMS. The EMS Coordinator also makes sure that all EMS tasks are completed and maintains the EMS Manual under the leadership of the EMR. In a small facility, the EMR and EMS Coordinator may be the same person.

■ **Cross-Functional Team (CFT):** The CFT is made up of members of each major operation within your facility who represent their area or department in several facets of the EMS and serve as an information resource. The CFT meets regularly.

Sample Form 1: EMS Responsibilities

EMS Function	Name	Regular Position
Environmental Management Representative (EMR)	Simon Cutright	Facility Manager
EMS Coordinator	Carol White	EH&S Manager
Cross-Functional Team	Willie Scott	Manufacturing Supervisor
	Darnell Jenkins	Injection Molding Line
	Julia Jordan	Finishing Line
	Paula Lingo	Packing Supervisor
	Jonathan Ash	Packing Line
	Maria Lopez	Sales Supervisor
	Oz Glenn	Building Maintenance

Why

The scope ensures that your facility's EMS is the right size and assigns responsibility for EMS tasks. Assignments won't get done if employees don't know whose job it is to do them.

How

A discussion between your facility's top manager or owner and key employees will quickly lead to a determination of the scope—what your EMS does and does not cover and why. It is important to assign the members of your EMS Team as soon as possible, as they will play key roles in developing your EMS.

Train employees who are assigned EMS tasks to make sure they are able to carry out their responsibilities. Training can take many different forms—from structured training classes to a two-minute chat once a week—as long as employees understand and can perform their job when it comes to the environment. To find out more on assigning responsibilities, see the "Who" section of each step in this document.

2 Create Your Environmental Policy Statement

What

An environmental policy states the main environmental commitments of your facility and guides the actions of employees and top management. It also demonstrates your facility's environmental performance commitments to employees, customers, and the public.

Who

Your EMS Team drafts your environmental policy.

Why

The policy sets the standard for how your facility interacts with the environment. It is a statement to employees, customers, and the public on how important the environment is to your facility. It recognizes that environmental performance is an important component of good business decisions.

Sample Environmental Policy

Star Plating is committed to improving the environment. We will do so by complying with all environmental laws and regulations. Star Plating also commits to:

- Minimize the amount of waste generated;
- Ensure the safe disposal of waste;
- Reuse and recycle whenever possible;
- Reduce emissions into the water and air;
- Use energy, water, and metals efficiently throughout our operations;
- Reduce human exposure to toxic materials in the facility and in the community;
- Monitor our environmental performance; and
- Continuously seek opportunities to improve on these principles.

At Star Plating, the environment is everyone's job, because we live here too.

Facility Manager: **Date:**   **Cross-Functional Team:**   **Date:**

_____   _____   _____   _____

                         _____   _____

                         _____   _____

                         _____   _____

                         _____   _____

How

Your EMS Team should develop the policy that outlines your facility's commitment to improved environmental performance. Examples of commitments that should be stated in your EMS policy (as presented by EPA's National Environmental Performance Track) include:

- Compliance with legal requirements and any voluntary commitments;

- Pollution prevention;

- Continuous improvement in environmental performance, including non-regulated areas; and

- Communication with your community about your facility's environmental performance and the operation of your EMS.

Once your EMS Team drafts your policy, they should sign it. Then, prominently display your policy throughout the facility to remind employees and visitors of your commitment to the environment. You can find interesting ways to remind your employees of the policy, such as printing the policy on T-shirts, coffee mugs, or identification badges. Top management should announce the policy to all workers to demonstrate its business importance.

Treat your environmental policy the same way you treat other types of company policies in decision-making, internal and external communication, implementation, and review. If your facility has a policy for quality control, consider building on it to develop your environmental policy. All employees and on-site personnel must be aware of the policy and implement it as they do their daily activities.

Identify Your Facility's Environmental Aspects

What

Environmental aspects are the elements of your facility's activities that either impact the environment or could potentially impact the environment. For example, a spill from a parts washer is an environmental aspect because of its potential impact on water or land.

Who

Assign people with process knowledge to determine your facility's environmental aspects. Or, assign the EMS Team to this task, with help from process-specific employees. Assign someone, such as the EMS Coordinator, to ensure that your environmental aspects are reviewed regularly to reflect facility changes, like new processes or materials.

Why

Knowing your facility's environmental aspects allows you to manage your facility's impacts and potential impacts on the environment.

How

There are several ways to identify your environmental aspects, such as:

- List the operations that fall within the scope of your EMS.

- Diagram your facility's inputs and outputs or processes to identify their environmental aspects.

- For each of your facility's operations, list the environmental aspects (environmental inputs such as water, energy, and raw materials) and environmental outputs (such as those that are discharged to water, air, or land).

Use Sample Form 2: Environmental Aspects and Impacts, below, to list the environmental aspects by operation, along with their actual or potential impacts (quantified to the extent possible).

Sample Form 2: Environmental Aspects and Impacts

Operation	Input/Out	Environmental Aspect (quantify if possible)	Environmental Impact
Material receiving/ storage	Cardboard boxes	Cardboard waste (500 lb./mo.)	Depletion of landfill space, air pollution from transport
	Wood pallets	Wood waste (500 lb./mo.)	Depletion of landfill space, air pollution from transport
	Plastic film	Plastic waste (70 lb./mo.)	Depletion of landfill space, air pollution from transport
	Energy (gasoline-powered fork lifts)	Air emissions (6 gal gasoline/mo.)	Depletion of oil, air quality degradation
Surface preparation	Abrasive blasting (cabinet)	Spent blasting media (average 50 lbs/mo.), particulate air emissions	Air quality degradation, depletion of landfill space
	Stripping solutions, acids, caustic cleaning solutions	Spent acids and solutions	Depletion of landfill space, air pollution from transport, air quality degradation, water quality degradation

Operation	Input/Out	Environmental Aspect (quantify if possible)	Environmental Impact
	Trichloroethylene degreaser	VOC air emissions, spent degreasing solutions	Depletion of landfill space, air pollution from transport, water quality degradation, air quality degradation
	Energy (2.500 kWh/mo. For all operations and administration)	Air emissions	Depletion of energy-producing resources, air quality degradation
	Rinse water	Wastewater sent to pretreatment unit, then to POTW (gal/mo.)	Depletion of water supply, water quality degradation
Metal finishing processes	Zinc and nickel plating	Spent plating solution, air emissions, sludge	Depletion of landfill space, air pollution from transport, air quality degradation, depletion of zinc and nickel
	Hard chrome plating	Spent plating solution, air emissions, sludge	Depletion of landfill space, air pollution from transport, air quality degradation, depletion of chromium, worker health
	Rinse water	Rinse water sent to pretreatment unit, then POTW	Depletion of water supply, water quality degradation
	Energy	Air emissions	Depletion of energy-producing resources, air quality degradation
Wastewater pretreatment	Rinse water	Treated effluent, sludge	Depletion of water supply, water quality degradation, depletion of landfill space, air pollution from transport
	Spent acids	Treated effluent, sludge	Water quality degradation, depletion of landfill space, air pollution from transport
	Spent caustic cleaners	Treated effluent, sludge	Depletion of natural resources, water quality degradation,
	Treatment chemicals	Treated effluent, sludge	Depletion of landfill space, air pollution from transport
	Sulfides and other air contaminants	Air emissions	Air quality degradation, worker health
	Energy	(See above)	(See above)
Laboratory operations	Lab wastes	Paper waste (40 lb/year or 6.67 lb/1000 units)	Depletion of landfill space, air pollution from transport
	Testing	Air emissions	Air quality degradation
	Energy	(See above)	(See above)
Building and ground maintenance	Landscaping	Water use	Depletion of water supply
	Lawn maintenance	Herbicide and insecticide runoff and/or leaching	Water quality degradation

Operation	Input/Output	Environmental Aspect *(quantify if possible)*	Environmental Impact
	Energy from gasoline	Air emissions	Air quality degradation, depletion of oil
General administration	Paper/office trash	Paper waste (40 .b/year or 6.67 lb/1000 units)	Depletion of trees, depletion of landfill space
	Product transportation	Air emissions	Air quality degradation, depletion of natural resources, depletion of landfill space (tires, etc.)
	Energy	(See above)	(See above)

Identify Relevant Legal Requirements

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and access the legal and other requirements that are applicable to them. In addition to the federal regulations listed below in the Overview of Federal Environmental Laws Applicable to Metal Finishing, be sure to check with your state and local authorities to determine other applicable requirements.

What

Once you determine your facility's environmental aspects, you must develop a procedure to identify

Overview of Federal Environmental Laws Applicable to Metal Finishing

Federal Environmental Laws	Applicability of the Laws
Clean Air Act (CAA) [40 CFR Parts 50-99] Establishes ambient and source emission standards and permit requirements for conventional and hazardous air pollutants. • Title V air permits and/or follow the standards for hazardous air pollutants under the NESHAP • State air permits	The Clean Air Act established a list of hazardous air pollutants (HAPs). Thirty-three substances in the TRI database for SIC 3471 (metal finishing) are HAPs. EPA promulgates emission standards for listed source categories. These standards are known as National Emission Standards for Hazardous Air Pollutants (NESHAPS). Two NESHAPs affect the metal finishing industry. • Chromium Electroplating (40 CFR 63, Subpart N). • Halogenated Solvent Degreasing/Cleaning (40 CFR 63, Subpart T). • Aerospace Manufacturing and Rework Facilities (40 CFR 63,Subpart GG).
Clean Water Act (CWA) [40 CFR Parts 100-145, 220-232, 410-471] Establishes standards and permit requirements for water pollutants, including sources that discharge directly to a water body or to a public sewer system. Also includes storm water management requirements.	The CWA regulates the amount of chemicals that are released by direct and indirect wastewater/effluent discharges. Facilities that discharge directly into a body of water must obtain a National Pollution Discharge Elimination System (NPDES) Permit. Facilities that discharge to a POTW must adhere to specified Pretreatment Standards. These standards include concentration-based limits on the discharge of a given chemical or toxic by a facility. There may be state or local conditions that require more stringent requirements than the guidelines. • Metal Finishing Effluent Guideline (40 CFR 433). • Electroplating Effluent Guideline (40 CFR 413).
Resource Conservation and Recovery Act (RCRA) [40 CFR Parts 240-299] Establishes regulations and permit requirements for hazardous waste management. Also creates standards for underground storage tanks that hold oil or hazardous substances.	RCRA classifies wastes such as solid waste sludge and requires certain methods for treatment, storage, and disposal. One of the classifications under RCRA is hazardous waste. A material is a hazardous waste if it meets the definition of solid ste (40 CFR 261.2) and exhibits one of the characteristics of a hazardous waste (40 CFR 261.20-24) or is listed as a hazardous waste (40 CFR 261.31-33). A hazardous waste is subject to Subtitle C generator (40 CFR 262), transporter (40 CFR 263) and Treatment, Storage, and Disposal Facility (TSDF) (40 CFR 254 and 265) requirements. Within RCRA Subtitle C, EPA has subcategories of hazardous wastes called "F" listings. F hazardous wastes include spent solvents (F001-F005) and electroplating wastewater treatment sludge (F006).

Federal Environmental Laws	Applicability of the Laws
Toxic Substances Control Act (TSCA) [40 CFR Parts 700-799]	Regulates the use, development, manufacture, distribution, and disposal of chemicals.
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or "Superfund") [40 CFR Parts 300-311]	Establishes a program for cleaning up contaminated waste sites and establishes liability for clean-up costs. Provides reporting requirements for releases of hazardous substances.
Emergency Planning and Community Right-To-Know Act (EPCRA) [40 CFR Parts 350-374]	Establishes a program (the "Toxic Release Inventory") to inform the public about releases of hazardous and toxic chemicals. Reporting requirements apply to companies that use, process, or store specific chemicals over certain quantities.
Hazardous Materials Transportation Act (HMTA) [49 CFR Parts 100-180]	Establishes standards for the safe transportation of hazardous materials.

* Check with your state and local authorities to determine other requirements your facility must meet.

Who

The EMS Coordinator determines applicable regulatory requirements.

Why

Identifying and having access to the legal and other requirements that are applicable to your environmental aspects is a crucial step in meeting your environmental commitments.

How

Determine your regulatory requirements by listing all of the environmental regulations that are applicable to your environmental aspects. Visit the National Metal Finishing Resource Center's Web site at **www.nmfrc.org/** for updated information about applicable regulations. See Sample Form 3: List of Legal and Other Requirements, below, for an excerpt of a table you can use to track your legal and other requirements.

Sample Form 3: List of Legal and Other Requirements (Excerpt)

Category/ Aspect	Legal or Other Requirement	Description	Laboratory Operations	Surface Preparation/ Finishing Processes	Metal Finishing Processes	Chrome Plating	Wastewater Pretreatment	Building/Ground Maintenance	General Administration	All Operations
Material Use*	Corporate Directive	Facility Strategy, Planning, and Implementation	X	X	X	X	X	X	X	
Air Emissions	40CFR Part 50	NAAQS National Primary and Secondary Air Quality Standards	X	X	X	X				
Air Emissions	40CFR Part 51	Emission of Hazardous Air Pollutants	X	X	X	X				
Air Emissions	40CFR Part 52	Emission of Hazardous Air Pollutants	X	X	X	X				
Air Emissions	40CFR Part 60 40CFR 60.42c and 60.43c (Boiler emission standards for sulfur dioxide and particulate matter)	Verification of Emissions		X	X	X				

5 Determine Your Facility's Significant Environmental Aspects

What

Significant environmental aspects (SEAs) are the aspects of your facility that have potentially significant impacts on the environment.

Who

The EMS Coordinator and CFT determine which of the environmental aspects are significant. The EMS Coordinator updates these determinations whenever the environmental aspects of the facility change.

Why

Prioritizing your environmental aspects helps your facility's management focus on managing the environmental aspects that have the greatest current or potential impact to the environment.

How

There are many ways to determine the significance of your environmental aspects. Whatever way you choose, be sure to document your decision process. The point is to look at all of your aspects and determine—in a common sense, systematic way—which of their impacts is environmentally significant. One way to determine the significance of your environmental aspects follows:

1. The EMS Coordinator uses the lists of environmental aspects (Sample Form 2) and compiles a master list of environmental aspects on Sample Form 4: Determining Significant Environmental Aspects. Where appropriate, aspects are grouped. For example, if consumption of energy is listed as an aspect in several areas, the Coordinator could choose to group

these so that energy use appears once on the master list.

2. The CFT then rates each aspect according to its impact in the following categories:

■ Regulator concerns;

■ Pollution;

■ Risk, including effects of chemicals and materials, impact on workers, impact on the surrounding community, impact on the environment, safety, and noise; and

■ Natural resource use.

3. Using Sample Form 4, aspects are assigned a relative value of 1 to 5, where:

   1. 1 stands for low impact (or risk, or potential for regulatory issues);

   2. 2, for medium-low;

   3. 3, for medium;

   4. 4, for medium-high; and

   5. 5, for high.

The CFT uses information recorded on Sample Form 2 and Sample Form 3 to assist in rating each impact.

4. A total score is developed for each aspect by adding the scores for each category. With all but the last column of Sample Form 4 complete, the CFT makes a final determination concerning which aspects are significant, based on the magnitude of the impact. As a general guide, the aspects that score the highest points are considered significant. The CFT, however, should use its best judgment in determining significance.

5. Aspects identified as significant are listed on Sample Form 4.

6. At this point, the CFT could make an initial effort to develop indicators for the SEAs.

7. Repeat this procedure on an annual basis.

Sample Form 4: Determining Significant Environmental Aspects
1=Low; 2=Medium-low; 3=Medium; 4=Medium-high; 5=High

Operation	Aspect	Impacts	Regulatory Concerns	Pollution	Risk	Natural Resources	Overall Score	Significant?
General administration	Paper waste	Depletion of trees, landfill space	1	1	1	1	4	No
General administration	Vehicle emissions	Air quality degradation, use of oil, landfill space	1	1	1	1	4	No
Laboratory operations	Lab wastes	Landfill space, air pollution from transport	1	1	2	1	5	No
Laboratory operations	Air emissions	Air quality degradation, worker health	1	1	2	1	5	No
All operations	Non-hazardous solid waste	Landfill space, air pollution from transport	3	1	2	2	8	No
All operations	Use of energy	Depleting energy producing resources, air quality degradation	1	1	4	4	10	Yes
All operations	Use of water	Depletion of water supply	1	1	4	4	10	Yes
All operations	Sludge generation	Landfill space, air pollution from transport	3	2	4	4	13	Yes
Surface preparation / finishing processes	Metal and cyanide emissions	Air quality degradation	3	3	4	4	14	Yes
Surface preparation	Organic emissions from degreaser	Air quality degradation, worker health	4	3	3	2	12	Yes
Metal finishing processes	Metal use	Landfill space, air pollution from transport, use of natural resources	1	3	4	4	12	Yes
Chrome plating	Chromium air emissions / human exposure	Air quality degradation, worker health	4	4	3	4	15	Yes
Wastewater pretreatment	Chemical use	Use of natural resources, water quality degradation,	1	2	2	2	7	No
		landfill space, air pollution from transport						
Wastewater pretreatment	Air emissions	Air quality degradation, worker health	2	2	2	2	8	No
Building / ground maintenance	Herbicide/ pesticide	Water quality degradation	1	1	2	1	5	No
Building / ground maintenance	Air emissions	Air quality, use of oil	1	1	1	1	4	No

6 Set Operational Controls

What

Operational controls are documented procedures, work instructions, best practices, posted placards, and action plans that cover situations where their absence could lead to deviations from the environmental policy. For instance, without which you might deviate from your commitment to comply with legal requirements or to achieve environmental performance improvement. At least one operational control should be in place for each significant environmental aspect (SEA) to ensure compliance with legal requirements and company policies (e.g., procedures, work instructions or posted placards) or to achieve improvement objectives (i.e., action plans).

Form 9: Links Between SEAs, Goals, Completion Dates, Operational Controls, and Monitoring and Measurement in Section 11 below provides examples of types of operational controls for addressing compliance assurance and environmental improvement objectives.

Document procedures for emergency preparedness and response (EP&R) that describe the "who, what, and when" of:

1. Assessing the potential for accidents and emergencies;

2. Preventing incidents and their environmental impacts;

3. Responding to incidents (emergency plans and procedures);

4. Routine testing of emergency plans and procedures; and

5. Mitigating impacts associated with accidents and emergencies.

Because many EH&S regulatory programs require emergency plans and/or procedures, you probably won't have to start from scratch. Examples of requirements related to EP&R that may apply to you are listed below.

Some facilities address these requirements through Integrated Contingency Plans that combine the requirements of regulatory programs into one consolidated plan. For information about this streamlined approach, and electronic versions of federal government guidance for consolidated plans, visit **www.epa.gov/region1/enforcement/epcra/oneplan.html**.

Regulatory Driver	Requirement
RCRA	Contingency Plan (LQG), Preparedness and Prevention Plan (LQG and SQG)
CWA	Spill Prevention, Control and Countermeasure Plan (SPCC) and Storm Water Pollution Prevention Plans (SWPPP)
OSHA	Process Safety Management
CAAA	Risk Management Program
EPCRA	Community Right-to-Know Reporting and Coordination with Local and State Emergency Response Committees

Who

The EMS Team ensures that operational controls are adequate and fills any gaps you find with new operational controls.

Why

Your operations and activities that are associated with SEAs must be under control to comply with your environmental policy. Operational controls ensure that operations and activities (such as waste water discharge monitoring, waste management, environmental performance improvement) are carried out effectively.

How

Your facility may already document most of the operational controls you'll need. Even so, it's important to survey your entire facility and its operations to match existing operational controls with your list of SEAs.

Typical Activities and Operational Controls at Metal Finishing Facilities

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

Set and Pursue Your Goals and Action Plans

What

Goals and action plans help your facility continuously improve its environmental performance. Your goals should have measurable targets and completion dates (for example, pounds of waste reduced by a certain date). Some of your goals should also exceed your current compliance commitments. Action plans should include means and timeframes for completion. You can think of documented action plans as operational controls that ensure you meet your performance improvement objectives.

Who

Your EMS Team ensures that performance improvement goals are set and attained. Top management commits to meet the goals.

Assign people to measure progress toward your environmental performance goals. Also assign people to take action when progress is not being made.

Why

Setting goals helps your facility continuously improve its performance while reducing environmental impacts.

How

Start by listing your facility's significant aspects then determine your goals. Use Sample Form 5: Goals, on the next page, to help you keep track of them. Here are the steps:

1. Be sure that your goals are realistic and fit your facility's mission and business strategy.

2. Be sure the goals reduce your impacts on the environment, have a timeline, and are measurable. For each goal, decide how to measure performance, and determine how the goal relates to your environmental policy. Keep in mind that you'll need baseline data to compare progress.

3. Set an action plan to achieve the goals. See Sample Form 6: Action Plans for a sample action plan.

4. Measure progress toward goals on a routine basis.

Sample Form 5: Goals

Goal	Significant Environmental Aspect	Related Policy	Performance Measurement Indicator(s)
Reduce water purchased by 50% in the first 5 years	Water use	Use energy, water, and metals efficiently	Monthly water bills
Reduce energy used by 25% in the first 5 years	Energy use	Use energy, water, and metals efficiently	Energy usage from electric bill, natural gas bill, gasoline receipts
Reduce land disposal of hazardous sludge by 50% and achieve an overall reduction of wastewater sludge generated in the first 5 years	Sludge generation and disposal	Minimize the amount of waste generated, ensure safe disposal of waste, reuse and recycle	Sludge generation records, annual waste summaries, and hazardous waste manifests
Reduce annual emissions of TRI metals and cyanide by 50% in the first 5 years	Metal and cyanide emissions	Use energy, water, and metals efficiently	TRI reporting data
Use or recycle off-site 98% of metals by the fifth year	Metal use	Use energy, water, and metals efficiently; reuse and recycle	Purchasing records and TRI data
Reduce organic emissions by 90% by the fifth year	Organic emissions from degreaser	Reduce emissions to water and air	TRI reporting data
Examine nontoxic substitutes for processes whenever possible	Human exposure to toxic materials/chromium emissions	Reduce human exposure to toxic materials in the facility and in the community	Processes changed

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Sample Form 6: Action Plans

Significant Environmental Aspect	Water use
Goal	Reduce the amount of water purchased by 50%
Action Plan	Analyze how water is used and what can be done to minimize water use. Consider different potential rinsing methods.
Review Cycle	Willie Scott will review every 6 months

Significant Environmental Aspect	Energy use
Goal	To reduce the amount of energy used by 25%
Action Plan	Analyze how the energy is being consumed and what can be done to use this energy more efficiently
Review Cycle	Willie Scott will review every 6 months

Significant Environmental Aspect	Sludge generation and disposal
Goal #1	To reduce the land disposal of hazardous sludge by 50%
Action Plan	Analyze how much sludge is being recycled vs. land applied, and examine ways to increase the amount being recycled
Review Cycle	Paula Lingo will review every 6 months
Goal #2	Achieve an overall reduction of wastewater treatment sludge generated in the first 5 years of the EMS
Action Plan	Examine why sludge is being generated and look at ways to decrease this
Review Cycle	Willie Scott will review every 6 months

Significant Environmental Aspect	Metal use/use of natural resources
Goal	Use or recycle off-site 98% of metals
Action Plan	Analyze how metals can be better used by the processes and how we can recycle more of the waste metals off site
Review Cycle	Willie Scott will review every 6 months

Significant Environmental Aspect	Organic emissions from degreaser
Goal	Reduce organic emissions by 90%
Action Plan	Analyze why these emissions occur and minimize the reason(s) that these emissions occur
Review Cycle	Willie Scott will review every 6 months

Significant Environmental Aspect	Human exposure to toxic materials/chromium emissions
Goal	Examine the use of less toxic substitutes for processes whenever possible
Action Plan	Examine the use of less toxic alternatives in all of our surface preparation and metal finishing processes
Review Cycle	Carol White will review every 6 months

For all significant aspects

Budget	$100/year for meetings; if capital investment is required then this budget will be determined at that time.
Schedule	1/03, manufacturing meeting with relevant manufacturing staff and EMS team to discuss the goal and brainstorm ideas. 2/03, EMS team and relevant manufacturing staff testing the best ideas. If testing reveals an idea with pursuing, then the EMS team will make sure that idea will be pursued and reassessed every 6 months.

Contact Person: Carol White   Date Completed: 11/35/02   Next Scheduled Updated: 11/25/03

Set Up an Employee Training Program

What

Employees and managers should be aware of the environmental policy, the SEAs and related procedures that apply to their work, key EMS roles and responsibilities, and the importance of meeting EMS requirements. Employees also should understand what might happen if they don't meet EMS requirements, such as spills, releases, and fines or other penalties.

Who

Everyone in your facility plays a role in environmental management. For this reason, cast a wide net for your training program.

Why

Train employees on environmental management because:

■ Legal compliance requires that certain job functions be trained;

■ Every employee can have potential impacts on the environment; and

■ Any employee can have a good idea to improve your facility's environmental management efforts.

How

Provide all employees with environmental awareness training on environmental issues. Also provide task-specific training to those employees whose jobs are associated with significant environmental aspects.

1. Awareness training. Provide a brief training to employees that covers an introduction to EMS, your environmental policy, significant environmental aspects, and environmental goals. This introduction provides an opportunity for the new employees to ask questions about the EMS. The main purpose of the awareness training is for the employees to get a feel for the context in which they will be performing environmentally-related duties.

2. Task-specific training. See Sample Form 7: EMS Work Instructions, below, for a sample list of task-specific training for activities with significant environmental impacts.

Sample Form 7: EMS Work Instructions

Significant Environmental Aspect	Associated Job Functions	Instruction	Responsible Person
Water use	Parts rinsing	Employees should monitor the drip time over the various rinse tanks and withdraw the parts at the proper speed	Plating supervisor
	Parts racking	Employees should rack parts to minimize solution dripping on other parts	Plating supervisor
Energy use	All employees	Turn off lights when office or building not in	Plant manager

Significant Environmental Aspect	Associated Job Functions	Instruction	Responsible Person
	Maintenance	Turn thermostats to a more cost-saving temperature when the building and office are empty; inspect and fix air leaks on a regular schedule; replace older, inefficient motors with newer, efficient models instead of repairing	Plant manager
Sludge generation and disposal	Wastewater treatment	Employees should follow procedures properly when treating waste	Environmental manager
	Sludge handling	Employees should now segregate sludge before disposal	Environmental manager
Metal and cyanide emissions	Wastewater treatment	Employees should follow procedures properly when treating waste	Environmental manager
Metal use	Parts rinsing	Employees should monitor the drip time over the various rinse tanks and withdraw the parts at the proper speed	Plating supervisor
	Parts racking	Employees should rack parts to minimize solution dripping on other parts	Plating supervisor
	Maintenance	Employees should make sure drip boards are in place and process solutions are properly filtered	Plant manager
Organic emissions from degreaser	Degreasing	Employees should use the new degreaser properly	Plating supervisor
Human exposure to toxic materials	All employees	Ensure new processes are being used properly	Plant manager

Create a Communications Strategy

What

An EMS should define the process for proactive internal and external communication. Internal communication should provide information about environmental requirements and voluntary commitments to all employees, on-site service providers, and contractors whose work could affect your ability to meet those requirements and commitments. External communication should provide information on your environmental programs and accomplishments to other stakeholders and include a way to provide feedback. Stakeholders include anyone who has a stake in your facility's environmental performance.

Who

Communications are handled by the CFT member representing the affected area, in coordination with the EMR. Communication of changes to legal and other requirements to employees are handled by the Area or Department Manager.

Appoint a community liaison (for example, the facility manager, supervisor, production supervisor, health, safety and security manager or the EMR) to manage external communications concerning the environmental aspects of your facility. The community liaison is responsible for:

■ Responding to inquiries from interested parties and regulatory agencies;

■ Sending current copies of the environmental policy to interested parties; and

■ Responding to media inquiries.

The EMR, in consultation with the community liaison, determines the need for and preparation of notifications to regulatory agencies on an as needed basis.

See Sample Form 8: Communications Program Matrix, below, for guidance on effective communications for employees, neighbors, and customers.

Sample Form 8: Communications Program Matrix

Stakeholder(s)	Potential Environmental Interest	What We Want to Tell Them	What We Want Them to Tell Us	How We Will Communicate with/Tell Them	When We Will Do It	Person Responsible
Employees	• Safety of workers • Protection of the environment • Competitiveness	Environmental policy	How to get it done	Memo, bulletin board, meetings, suggestion box, Intranet	Initial training for new employees, EMS update at annual picnic, as needed via training program for specific workers	EMR, CFT, and training personnel
Neighbors	• Expansion of facility, near residences • Run-off into creek behind wastewater treatment plant	Environmental policy and EMS plans	Their environmental concerns, particularly regarding planned expansion	Meetings, open house, flyers, suggestion box, Web site	Town meeting in November (for expansion discussion) Annual open house Web site (ongoing)	EMR with communications representative (as appropriate)
Customers	• Major client considering requiring EMS for suppliers	Environmental policy and EMS plans	Specific EMS requirements that might ensue	Above, plus inserts in direct mail advertising, or invoices and on our Web site	Ongoing and as billing occurs	Marketing lead and facility president

Why

Internal and external stakeholders can play an important role in developing the facility's EMS. Employees can provide strong support for EMS development. Customers, suppliers, and neighbors also can provide useful contributions. Partnerships with trade associations, suppliers, professional associations, and universities can also help develop your EMS.

Your stakeholders' concerns may be very different from what you expect and may be less difficult to resolve than you think. The only way to find out is to talk with them.

How

Discuss the stakeholders you want to include in your EMS process, the benefits of including stakeholders, and tips for better communication with stakeholders. While employee involvement is critical to your EMS' success, the inclusion of other stakeholders is up to you. You may want to start by communicating with stakeholders who have expressed interest in your facility. To locate additional stakeholders, follow the steps below:

■ Ask your employees, including facility managers and public relations personnel;

■ Get suggestions from local officials;

■ Ask a local planning agency; and/or

■ Get input from national advocacy groups regarding local or national groups.

Create a list of everyone who would be interested in your facility's environmental activities and how you can reach them (if you already have established ways of communicating with certain groups, start with those). Then make a decision about where to begin. You can start with staff and later add other stakeholders, if that suits your needs. It's helpful to make your communication list as complete as possible and then pare it down to a manageable size.

When any form of communication is received from a stakeholder about your facility's environmental performance, ensure that the message is immediately forwarded to your EMR. The EMR decides whether and how to respond to the communication. Do your best to respond in kind to all good-faith communications from stakeholders about environmental issues, including complaints, comments, and information requests.

10 Set Up Documentation for Your EMS

What

Documentation is a requirement of an EMS, but it should not be the main emphasis. Limit your documentation efforts to the minimum necessary. EMS documentation is different than EMS records. EMS documentation describes what you do and how you do it, while EMS records demonstrate that you are doing what the documentation said you would do.

Some sort of EMS Manual, either electronic or hard copy, can be your EMS documentation and should:

■ Describe the core elements of your EMS and how the elements interact; and

■ Provide direction to related documentation.

Who

People in each area of your facility that has environmental impacts should contribute to EMS documentation. The EMS Coordinator compiles the information into a report or environmental database.

Why

Documentation describes the elements of your EMS, demonstrates compliance with environmental regulations, and lists key employees.

How

Keep your EMS documentation simple. Your EMS Manual doesn't need to describe every detail of your EMS. Instead, it can reference other documents or procedures. Update your EMS documentation as needed, based on any system improvements you put in place. Take a look at "Star Plating's" EMS Manual, which is included in Part II of this publication.

Documentation can be in electronic or hard copy format. Make sure that your documentation is legible and that the most up-to-date version is available on site. Documentation should be available for all EMS components, including:

■ Your environmental policy;

■ Your organizational chart or lists/tables of key responsibilities;

■ A description of how your facility satisfies the EMS requirements;

■ System-level procedures (for example, procedure for corrective and preventive action);

■ Activity- or process-specific operational control procedures/work instructions; and

■ Other EMS-related documents (such as emergency preparedness and response plans, training plans, etc.).

If you already have documentation for certain regulations or permits, use it for your EMS instead of recreating it.

11 Measure and Record Your Performance

What

Measurement and record keeping means that your facility:

■ Monitors operations and activities that can have significant environmental impacts and/or compliance consequences;

■ Tracks performance (including your progress in achieving your goals);

■ Calibrates and maintains monitoring equipment; and

■ Periodically evaluates compliance with applicable laws and regulations through internal audits.

The measurement process uses records and generates records. Records prove that the processes that make up your EMS are being implemented. Records management helps you decide which records you will keep, how you will keep them, and for how long. You should also think about how you will dispose of records when you no longer need them.

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

Who

EMS procedures and work instructions designate who performs measurement activities, who records completion of EMS activities, and who manages the records that are created. The intent of the EMS is to make as much of the measurement and record keeping as practical the responsibility of people whose jobs could significantly impact the environment. The EMS Coordinator or department where the environmental activity occurs is responsible for managing the relevant records.

Why

Measurement and record keeping helps you manage your organization. The results of pollution prevention and other efforts are easier to demonstrate when current and reliable data are available. These data can help you demonstrate the EMS' value to top management.

The purpose of records management is to demonstrate that your facility is implementing the EMS as designed. While records have value internally, you also may need to give them to others (such as customers, a registrar, or the public), as proof of EMS implementation.

Note on Measuring Performance

You may want to tie your measurements to production numbers to make sure that you don't inaccurately show progress. For example, if your goal is to reduce energy use in kilowatts by 10 percent over the next three years and during that time you reduce your production, then your energy savings may be a result of reduced production and not of improved performance. In this example, a better measure would be kilowatts used per 1,000 units produced.

How

Choose a limited number of factors that can have a big impact on the outcome of a process, then determine how to measure those factors. See Sample Form 9: Links Between SEAs, Goals, Completion Dates, Operational Controls, and Monitoring and Measurement, below, for a sample form you can customize to show the link between measurement and your SEAs.

Here are some things to consider as you determine your facility's process for records management:

■ Identify which EMS records are required. Look at your other procedures and work instructions to decide what evidence is needed. Also consider records that are required by legal requirements.

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

- Create forms to implement your EMS. When these forms are filled out, they become records. Forms should be simple and understandable.

- Establish a records retention policy and stick to it. Make sure that your policy takes into account records retention requirements specified in environmental regulations. For example, hazardous waste manifests must be maintained for a specified period of time under RCRA.

- Consider who needs access to what records in what circumstances.

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

- Think about which records might require additional security. Do you need to restrict access to certain records? Should a back-up copy of critical records be kept at another location? Should a hard copy of some records be kept in case an inspector arrives and your computer system is down?

Sample Form 9: Links Between SEAs, Goals, Completion Dates, Operational Controls, and Monitoring and Measurement

Significant Aspect	Goal	Operational Control	Monitoring and Measurement	Completion Date	Progress to Date
Metal Cyanide Emissions	Maintain compliance	• Title V Permit • Air Emissions Abatement Equipment O&M	• Air Emissions Abatement Equipment Monitoring Log • Compliance audit • Regulatory reporting • EMS audits	Ongoing	Ongoing
Water Use	Reduce water use	• Water use reduction Action Plan	• Monthly water bills • EMS audits	50% by January 2009	10% reduction as of January 2004
Human Exposure to Toxic Materials/ Chromium Emissions	Investigate potential for reduction	Human exposure to toxic materials action plan	• Human exposure reduction tracking metric • EMS audits	Complete study by January 2005	Best available technologies have been identified and vendors have been contacted.

12 Conduct Audits and Correct Problems

What

EMS internal audits assess whether your EMS is adequate and verify that your EMS plans are being followed. By identifying and reporting EMS deficiencies to your management, you are able to:

■ Maintain management's focus on the environment;

■ Improve the EMS and its performance; and

■ Ensure the cost effectiveness of the system.

Your EMS must include a well-defined process for ensuring that:

■ Problems are identified;

■ Root causes are investigated;

■ Corrective and preventive actions are assigned and implemented; and

■ Actions are tracked and their effectiveness verified.

Who

Select and train EMS internal auditors on an ongoing basis. Commercial EMS auditor training is available, but it may be less expensive to coordinate with local businesses, community colleges, or other organizations to sponsor an auditor training course.

Train auditors on auditing techniques, the concept of management systems, and, if possible, on environmental regulations, facility operations, and environmental science. While some auditor training can take place on the job, make sure that an experienced auditor takes part in your facility's first few EMS audits.

Auditors should be independent of the activities being audited. If your facility has a quality management system, you may want to think about using your internal quality auditors as EMS auditors. See Sample Form 10: Sample Internal Audit Checklists for samples of checklists you can customize to conduct your own internal audits.

Why

EMS internal audits ensure that your system will continue to work well in the face of accidents, emergencies, changing rules, staff turnover, etc. By regularly evaluating your EMS, you will be able to identify which parts of the EMS are working well and which need improvement. Your EMS needs to change as your facility adapts and grows. You will need a nonconformance, corrective, and preventive action process to deal with system deficiencies.

How

To ensure an effective EMS internal audit program:

■ Develop internal audit procedures;

■ Determine how often you will conduct audits;

■ Select and train your auditors; and

■ Keep records of your audits.

Conduct internal audits at least once a year. Auditors base their evaluation on interviews with employees, observations, and documentation instead of just going down a list and making sure that all documentation is in place.

Work with your EMS Coordinator to determine the questions and observations that will tell you if your EMS is reducing risk, improving environmental performance, and facilitating compliance. Review the sample internal audit checklists provided below. Once you have gathered all the information and drawn conclusions, present a report to top management. The EMS Team can work with top management to make any needed changes to the EMS.

The steps to develop a well-defined process for your EMS include:

■ Identify the problem;

■ Find the root cause;

- Come up with a solution;

- Implement the solution;

- Document the solution;

- Communicate the solution; and

- Evaluate the effectiveness of the solution.

Preventing problems is generally cheaper than fixing them after they occur. Start thinking about problems as opportunities to improve!

Sample Form 10: Sample Internal Audit Checklists

Environmental Policy

Questions	Findings/Observations
1. Do you know the facility's Environmental Policy?	
2. What are the keywords of the Policy?	
3. How does the Policy relate to your job?	
4. What is your understanding of the facility's EMS and your role?	
ADDITIONAL QUESTIONS:	

Environmental Aspects

Questions	Findings/Observations
(Look for documentation of planning/evidence of implementation)	
1. Are you aware of the aspects and the significant environmental aspect in your department?	
2. What are they?	
3. Where can they be found?	
ADDITIONAL QUESTIONS:	

Goals

Questions	Findings/Observations
1. Do you know what the goals for the significant environmental aspects are?	
2. Where can these be found?	
3. What is the status or progress on the goals with which your department is involved?	
ADDITIONAL QUESTIONS:	

Training, Awareness, and Competence

Questions	Findings/Observations
1. Have you received awareness training on the facility's environmental management system and the significant environmental aspects in your department?	
2. Have you received training on your role and responsibility to conform with the facility's: a. Environmental Management System b. Emergency preparedness and response	
3. Are you aware of the potential consequences of departure from your environmental work practices (environmental impact)?	
ADDITIONAL QUESTIONS:	

Communication

Questions	Findings/Observations
1. Have you received information on the facility's Environmental Management System and significant environmental aspects?	
2. How (e.g., facility newsletter, department meetings, training, posters, pocket cards)?	
3. Do you have an example?	
4. If you had a concern about the EMS or any environmental concern, what would you do?	
ADDITIONAL QUESTIONS:	

Document Control

Questions	Findings/Observations
1. Do you have access to current versions of your department's action plans, procedures, and/or environmental work instructions?	
2. Where are they kept?	
3. If there are any postings in the department check to see if they are current.	
ADDITIONAL QUESTIONS:	

13 Management Review

What

A management review answers the question, "Is the system working?" Your facility's top management should do a comprehensive review of your EMS periodically, such as quarterly, although all of your EMS elements don't need to be reviewed at once. Review of the policy, goals, and procedures should be carried out by the level of management that defines them. The management review should include:

- Internal audit results and status of preventive and corrective actions;
- Progress in meeting goals;
- The suitability of the EMS in relation to changing conditions and information; and
- Concerns of interested parties.

Who

Top management reviews EMS items prepared by the EMS Team.

Why

Management reviews inform top management of the status of your EMS and offer a great opportunity to keep your EMS efficient and cost effective. If your top management finds that EMS procedures and other activities don't add value, eliminate them.

How

Your management review should answer the following questions:

- Is our environmental policy still relevant?
- Are roles and responsibilities clear and do they make sense?
- Are we applying resources appropriately?
- Are we meeting our regulatory obligations?
- Are the procedures clear and adequate? Do we need others? Should we eliminate some?
- What effects have changes in materials, products, or services had on our EMS?
- How effective are our measurement and assessment systems?
- Can we set new measurable performance goals?
- Do we need to change some of our approaches because of changes in laws or regulations?
- What stakeholder concerns have been raised since our last review?
- Is there a better way? What else can we do to improve?

Create a continual improvement plan and check progress against your plan. Be sure to document your observations and conclusions, through the use of a record such as the one provided as Sample Form 11: Management Review Record. Assign action items to the EMS Team to ensure follow-up on each item and schedule the next management review.

Sample Form 11: Management Review Record

Date of review meeting: 4/5/2004	

Persons present at meeting:

Name	*Position*
Mike Baker	Owner and president
Joe Stevens	Plant manager and EMR
Carol White	EH&S manager

Conclusions

This is the first quarterly management review. It appears that the EMS is up and running, but reinforcement is needed. Employees show an awareness of the general concepts of the EMS, but are not always aware of how they fit into the process and how their job is different as a result of the EMS. Next month we will have a meeting for all managers and supervisors. AT the meeting the EH&S manager will teach the supervisors what key points need to be emphasized to workers. Each supervisor is to have a meeting with their staff to go over these points. This meeting should be document—including date, time, and attendees.

We are encouraging all supervisors to come to the next supervisor meeting with examples of what techniques work and what techniques do not work; our goal is to get all staff to uphold the work instructions that are part of the EMS. For those areas of the plant that do not have specific work instructions in the EMS Manual, the supervisor will motivate folks to come up with efficiency ideas. We have decided that at the end of the fiscal year, the staff person who comes up with the best EMS idea will get 10 percent of the savings that resulted from the idea. The contributor's supervisor will be favorably viewed, as well.

Actions to be taken	Person(s) responsible
Manager and supervisor meeting	EH&S manager
Supervisor meeting with their staff	Every supervisor
Signed: Joe Stevens	Mike Baker
Plant Manager and EMR	Owner and president

Part II: Sample Manual and Blank Forms

Below is a Sample EMS Manual for a hypothetical metal finishing facility.

Star Plating EMS Manual

Prepared by: Joe Hagenburger

Approved and Authorized by: David Shaw (President)

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Purpose of This Manual

This EMS Manual defines the scope of Star Plating's Environmental Management System (EMS) and provides a linkage of system documents to the various elements of the ISO 14001:1996 standard.

The control of this Manual is in accordance with the Star Plating Environmental Procedure for Document Control. All copies of this EMS Manual not marked "CONTROLLED DOCUMENT" are uncontrolled and should be used for reference purposes only.

Amendments to this Manual will be issued by the Environmental Management Representative (EMR) or designee following approval by the Plant Manager.

CONTENTS

1.0
Scope, Structure, and Responsibility

The Star Plating EMS provides a mechanism for environmental management throughout all areas and departments at the facility in [Fictional State Name]. More specifically, it covers operations beginning at the points of entry of raw materials and energy, to the point of exit of finished manufactured products. In addition to manufacturing processes and activities, all other on-site operations fall within the scope of the EMS, including maintenance, grounds-keeping, and offices. The EMS takes waste disposal into account in evaluating the environmental impacts of on-site activities, even though Star Plating may not be the final disposer of its waste. The EMS covers environmental aspects that a facility can control and directly manage and those it cannot control or directly manage but can be expected to have an influence.

EMS roles, responsibilities, and authorities are defined at relevant functions and levels within the facility. Top management provides the resources essential to the implementation and control of the EMS, including: training; human resources; specialty services; financial resources; and technical and informational services. The Environmental Management Representative (EMR) has primary responsibility for establishing, operating, and maintaining the EMS. An EMS Coordinator provides routine EMS support and reports directly to the EMR. Members of the Cross-Functional Team (CFT), which includes members from each major operation within the facility, are responsible for representing their area or department in several facets of the EMS, such as identifying environmental aspects, determining significant environmental aspects (SEAs), setting goals, implementing action plans, reviewing and tracking EMS internal audits results, and serving as an information resource.

Reference Material

ISO 14001 Standard (4.4.1)

2.0
Environmental Policy

The Star Plating Environmental Policy (Policy) is endorsed by the Facility Manager. The policy covers all activities at the facility. The Policy includes a commitment to continual improvement and pollution prevention as well as a commitment to meet or exceed relevant environmental legislation, regulations, and other requirements. The Policy will be reviewed annually by top management, communicated to all employees, and made available to the public in accordance with the Communication with Stakeholders procedure.

Reference Material

ISO 14001 Standard (4.2)

Applicable Procedures and Forms

Communication with Stakeholders

3.0
Environmental Aspects

The Star Plating has established a procedure for identifying the environmental aspects that the facility controls and over which it may be expected to have an influence.

Reference Material

ISO 14001 Standard (4.3.1)

Applicable Procedures and Forms

■ Procedure for Environmental Aspects, Objectives and Targets, and Action Plans
■ Form for Significant Environmental Aspects
■ Form for Linking SEAs, Objectives and Targets, and EMS Operational Control Procedures to Measurement Indicators, Job Functions, Responsible Parties, and Applicable Processes
■ Procedure for Identification of Legal and Other Requirements
■ Procedure for Environmental Review for New Purchases, Processes, and Products

4.0
Legal Requirements

Star Plating has established a procedure for identifying, accessing, and communicating legal and other requirements to which the facility subscribes. The EMS Coordinator identifies, communicates to appropriate parties, and makes available changes to local regulations. At least annually, the EMS Coordinator reviews the most current national, regional, provincial, state, and local legal and other requirements as applicable to Star Plating. Star Plating also has established a procedure to secure approval from regulatory agencies for processes and activities affecting air emissions, waste management or water discharges, as well as the method for other environmental approvals.

Reference Materials

ISO 14001 Standard (4.3.2)

Applicable Procedures and Forms
- Procedure for the Identification of Legal and Other Requirements
- Procedure for Obtaining Agency Approval
- Form for Legal and Other Requirements

5.0
Significant Environmental Aspects

Star Plating has established a procedure for determining which of its environmental aspects will be considered significant. Discussions regarding significance are recorded in CFT meeting minutes. The SEAs are reviewed at least semi-annually by the CFT or when there is a new or changed process or activity at the facility. The EMR maintains CFT minutes and other records.

Reference Material

ISO 14001 Standard (4.3.1)

Applicable Procedures and Forms
- Procedure for Environmental Aspects, Objectives and Targets, and Action Plans
- Form for Significant Environmental Aspects
- Form for Linking SEAs, Objectives and

Targets, and EMS Operational Control Procedures to Measurement Indicators, Job Functions, Responsible Parties, and Applicable Processes
- Procedure for Identification of Legal and Other Requirements
- Procedure for Environmental Review for New Purchases, Processes, and Products

6.0
Operational Controls

The Star Plating CFT is responsible for identifying operations and activities associated with SEAs that require operational controls. Work Instructions cover the environmental control of specific operational activities and are usually activities specific in their application.

Star Plating has a procedure for identifying and controlling the SEAs of suppliers and contractors.

Star Plating has an environmental procedure to identify the potential for and to respond to accidents and emergency situations and for preventing and mitigating the environmental impacts that may be associated with them. Emergency methods are reviewed by the CFT on an annual basis and after the occurrence of accidents or emergency situations.

Reference Material

ISO 14001 Standard (4.4.6 and 4.4.7)

Applicable Procedures and Forms
- Procedure for Contractors and Sub-contractors
- Procedure for Emergency Preparedness and Response
- Form for Emergency Preparedness and Response Requirements
- Worksheet for Linking SEAs to Operational Controls, Measurement Indicators, Job Functions, Responsible Parties, and Locations of Documents

7.0
Goals and Action Plans

The Star Plating CFT has developed goals for each SEA that define:

1. The performance goals (Investigate/Study, Control/Maintain, or Improve) for each SEA;

2. The specific, quantified targets that define those performance goals; and

3. The planned deadlines for the achievement of those targets.

Goals are developed considering: SEAs; technological options and financial, operational, and business plans; and the views of interested parties.

The CFT establishes action plans as a means to achieve goals. These plans define the principal actions to be taken, those responsible for undertaking those actions, and the scheduled times for their implementation. The action plans are developed by the CFT and approved by top management.

Star Plating also has established a procedure to ensure that environmental management applies to new developments and new or modified activities, products, or services.

Reference Material

ISO 14001 Standard (4.3.3 and 4.3.4)

Applicable Procedures and Forms
- Procedure for Environmental Aspects, Objectives and Targets, and Action Plans
- Procedure for Environmental Review for New Purchases, Processes, and Products
- Forms for Action Plan
- Project Environmental Checklist

8.0
Training, Awareness, and Competence

Star Plating identifies, plans, monitors, and records training needs for personnel ay have a significant impact upon the environment. Star Plating has established a procedure to train employees at each relevant function and level so they are aware of the environmental policy, SEAs, their roles and responsibilities in achieving conformance with the policy and procedures, and with the requirements of the environmental management system. The training coordinator is responsible for maintaining employee training records. Appropriate records are monitored and reviewed on a scheduled basis. Competency is determined by the employee's supervisor as specified in the Procedure for Environmental Training and Awareness.

Reference Material

ISO 14001 Standard (4.4.2)

Applicable Procedures and Forms
- Procedure for Environmental Training and Awareness
- Training Needs Analysis Matrix
- Training Needs Analysis—Procedures and Work Instructions by Area/Department

9.0
Communication

Star Plating has established and will maintain a procedure for internal and external communications regarding the EMS. Star Plating has considered a process for external communication on its SEAs and has decided to make that information available upon request.

Reference Material

ISO 14001 Standard (4.4.3)

Applicable Procedures
- Procedure for Communication with Stakeholders
- External Stakeholder Communication Record

10.0
EMS Documentation and Document Control

This EMS Manual describes the core elements of the management system and their interaction and provides direction to related documentation. These documents define the mechanisms for the establishment, implementation, and maintenance of the EMS and ensure that the system is maintained in accordance with the environmental policy and goals and is communicated to suppliers and contractors. These procedures are facility-wide in their application.

Star Plating has established an environmental procedure for controlling EMS documents. This procedure describes where documents can be located and how and when they are reviewed. The procedure ensures that current versions are available and that obsolete documents are promptly removed from use or are suitably identified.

Reference Material

ISO 14001 Standard (4.4.4 and 4.4.5)

Applicable Procedures and Forms

■ Procedure for Document Control

■ Master Document List

11.0
Monitoring, Measurement, and Records

Star Plating has established a procedure to monitor and measure the key characteristics of its operations and activities that can have a significant impact on the environment. This procedure includes calibration and maintenance requirements and ensures that records will be retained. The procedure also describes requirements to calibrate and maintain monitoring equipment, and to evaluate compliance with relevant environmental legal and policy requirements.

Star Plating has a procedure to identify, maintain, and dispose of environmental records. These records include training records and the results of audits and reviews. They are readily retrievable and protected against damage, deterioration, and loss. The Areas and Departments maintain their own environmental records. Record and document retention is also specified in the procedure.

Reference Material

ISO 14001 Standard (4.5.1, 4.5.3)

Applicable Procedures and Forms

■ Procedure for EMS and Regulatory Compliance Audits

■ Procedure for Monitoring and Measurement

■ Environmental Measurement Indicators Log

■ Calibration Log

■ Compliance Tracking Log

■ Environmental Records

■ Index of Environmental Records

12.0
EMS Audits, Nonconformance, and Corrective and Preventive Action

Star Plating has a procedure for conducting periodic system audits that ensure the EMS has been properly implemented and maintained. A summary of these audits is provided to top management. Audits are performed according to a schedule that is based on the environmental importance of an activity, the results of previous audits, and the audit schedule. Auditors are trained and audit records are kept with the Audit Program Leader.

Star Plating has a procedure for defining responsibility and authority for handling and investigating nonconformances, for taking action to mitigate impacts, and for initiating and completing corrective and preventive action. Any changes in procedures resulting from corrective and preventive actions are implemented and recorded.

Reference Material

ISO 14001 Standard (4.5.4, 4.5.2)

Applicable Procedures and Forms

- Procedure for EMS and Regulatory Compliance Audits
- Internal EMS Audit Checklist
- Form for Internal EMS Audit Schedule
- Procedure for Corrective and Preventive Action
- Corrective and Preventive Action Request
- Corrective and Preventive Action Tracking Log

13.0
Management Review

Star Plating has a procedure for EMS review by top management. Top management reviews all elements of the EMS at least annually to ensure its continuing suitability, adequacy, and effectiveness. Meeting minutes record these reviews and are kept by the EMR or designee.

Reference Material

ISO 14001 Standard (4.6)

Applicable Procedures and Forms

Procedure for Environmental Management System Management Review

Management Review Record

Record of Revisions

Revision Date	Description	Sections Affected

Form 1: EMS Responsibilities

EMS Function	Name	Regular Position

For documenting requirements in ISO 14001 Standard (4.4.1)

Form 2: Environmental Aspects and Impacts

Operation	Input/Output	Environmental Aspect *(quantify if possible)*	Environmental Impact

For documenting requirements in ISO 14001 Standard (4.3.1)

Form 3: List of Legal and Other Requirements

Category/ Aspect	Legal or Other Requirement	Description	Laboratory Operations	Surface Preparation/ Finishing Processes	Metal Finishing Processes	Chrome Plating	Wastewater Pretreatment	Building/Ground Maintenance	General Administration	All Operations

For documenting requirements in ISO 14001 Standard (4.3.2)

Form 4: Determining Significant Environmental Aspects

Operation	Aspect	Impacts	Regulatory Concerns	Pollution	Risk	Natural Resources	Overall Score	Significant?

For documenting requirements in ISO 14001 Standard (4.3.1)

Form 5: Goals

Goal	Significant Environmental Aspect	Related Policy	Performance Measurement Indicator(s)

Contact Person: Date Completed: Next Scheduled Update:

For documenting requirements in ISO 14001 Standard (4.3.3 and 4.3.4)

Form 6: Action Plans

Significant Environmental Aspect	
Goal	
Action Plan	
Review Cycle	

Significant Environmental Aspect	
Goal	
Action Plan	
Review Cycle	

Significant Environmental Aspect	
Goal	
Action Plan	
Review Cycle	

Significant Environmental Aspect	
Goal	
Action Plan	
Review Cycle	

Significant Environmental Aspect	
Goal	
Action Plan	
Review Cycle	

Significant Environmental Aspect	
Goal	
Action Plan	
Review Cycle	

Significant Environmental Aspect	
Goal	
Action Plan	
Review Cycle	

For all significant aspects

Budget	
Schedule	

Contact Person: Date Completed: Next Scheduled Updated:

For documenting requirements in ISO 14001 Standard (4.3.3 and 4.3.4)

Form 7: EMS Work Instructions

Significant Environmental Aspect	Associated Job Functions	Instruction	Responsible Person

For documenting requirements in ISO 14001 Standard (4.4.6 and 4.4.7)

Form 8: Communications Program Matrix

Stakeholder(s)	Potential Environmental Interest	What We Want to Tell Them	What We Want Them to Tell Us	How We Will Communicate with/Tell Them	When We Will Do It	Person Responsible

For documenting requirements in ISO 14001 Standard (4.4.3)

Form 9: Links Between SEAs, Goals, Completion Dates, Operational Controls, and Monitoring and Measurement

Significant Aspect	Goal	Operational Control	Monitoring and Measurement	Completion Date	Progress to Date

For documenting requirements in ISO 14001 Standard (4.5.1 and 4.5.3)

Form 10: Sample Internal Audit Checklists

Environmental Policy

Questions	Findings/Observations
1.	
2.	
3.	
ADDITIONAL QUESTIONS:	

Environmental Aspects

Questions	Findings/Observations
1.	
2.	
3.	
ADDITIONAL QUESTIONS:	

Goals

Questions	Findings/Observations
1.	
2.	
3.	
ADDITIONAL QUESTIONS:	

Training, Awareness, and Competence

Questions	Findings/Observations
1.	
2.	
3.	
ADDITIONAL QUESTIONS:	

Communication

Questions	Findings/Observations
1.	
2.	
3.	
ADDITIONAL QUESTIONS:	

Document Control

Questions	Findings/Observations
1.	
2.	
3.	
ADDITIONAL QUESTIONS:	

For documenting requirements in ISO 14001 Standard (4.5.4 and 4.5.2)

Form 11: Management Review Record

Date of review meeting:

Persons present at meeting:	
Name	*Position*

Conclusions

Actions to be taken	Person(s) responsible

Signed:

For documenting requirements in ISO 14001 Standard (4.6)

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