# Environmental Management System Implementation Guide for the Electric Arc Furnace Iron & Steel Industry

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# ACKNOWLEDGMENTS

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This document includes a combination of examples and tools from EPA-sponsored EMS source documents (see Appendix A for an annotated list of sources) and actual industry examples provided by SMA members. Important contributions were made by the following individuals and organizations: ICF Consulting; Chris Avent and Jack Skelley, Gerdau Ameristeel; Mike Peters, Structural Metals, Inc. - Texas (Commercial Metals Steel Group); Leonard Robinson, formerly of TAMCO; and Joseph Green, Collier Shannon Scott.

# LIST OF ACRONYMS

| Acronym | Full Name |
|---|---|
| BACT | Best available control technology |
| CAA | Clean Air Act |
| CAR | Corrective Action Request |
| CEMP | Code of Environmental Management Principles |
| CERCLA | Comprehensive Environmental Response, Compensation and Liability Act |
| CFCs | Chlorofluorocarbons |
| CFT | Cross-Functional Team |
| CWA | Clean Water Act |
| DfE | Design for the Environment |
| EAF | Electric Arc Furnace |
| EMP | Environmental Management Program |
| EMR | Environmental Management Representative |
| EMR | Environmental Management Review |
| EMS | Environmental Management Systems |
| EP&R | Emergency preparedness and response |
| EPA | U.S. Environmental Protection Agency |
| EPCRA | Emergency Planning and Community Right-To-Know Act |
| HAPs | Hazardous Air Pollutants |
| HMTA | Hazardous Materials Transportation Act |
| HMTUSA | Hazardous Materials Transportation Uniform Safety Act |
| ISO | International Organization for Standardization |
| LAER | Lowest achievable emission rate |
| LEPC | Local emergency planning committee |
| MACT | Maximum achievable control technology |
| NA | Non-attainment |
| NAAQSs | National Ambient Air Quality Standards |
| NCR | Non compliance form |
| NESHAPs | National Emission Standards for Hazardous Air Pollutants |
| NPDES | National Pollution Discharge Elimination System |
| NRC | National Response Center |
| NSR | New Source Review |
| OJT | One the Job Training |
| PAR | Preventive Actions Request |
| PCBs | Polychlorinated Biphenyls |
| PM | Particulate Matter |
| POTW | Publicly Owned Treatment Works |
| PSD | Prevention of Significant Deterioration |
| RCRA | Resource Conservation and Recovery Act |
| SAA | Satellite Accumulation Area |
| SDWA | Safe Drinking Water Act |
| SEA | Significant Environmental Aspect |

| Acronym | Full Name |
|---|---|
| SERC | State Emergency Response Commission |
| SIPs | State Implementation Plans |
| SMA | Steel Manufacturers Association |
| SOP | Standard operating procedure |
| SSP | Sector Strategies Program |
| TCLP | Toxicity Characteristic Leaching Procedure |
| TSCA | Toxic Substances Control Act |
| TSDF | Treatment, Storage, and Disposal Facility |
| WWTP | Waste Water Treatment Plant |
| **EMS Documents** | |
| F-XXX | Form- |
| P-XXX | Procedure- |
| WI-XXX | Work Instructions- |

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# INTRODUCTION

This Electric Arc Furnace Iron & Steel Industry Environmental Management System Guide (EMS Guide) is intended for business owners or managers who have decided to develop an EMS for their company or their facility (hereafter we use the label "facility," however an EMS also can be implemented on a company-wide scale). It also is intended to guide environmental performance improvement for facilities that already have a formal EMS in place.

The EMS Guide is comprised of two sections: ***Section I: EMS Guidance*** and ***Section II: EMS Documentation***. The tools and examples in both sections are drawn from actual electric arc furnace (EAF) steel manufacturing facility examples that were provided by Steel Manufacturers Association (SMA) members and staff and with support of the U.S. Environmental Protection Agency (EPA) Sector Strategies Program (SSP). EPA-sponsored EMS documents were also adapted and used (see ***Section I: Appendix A*** for an annotated list of sources).

The EMS Guide is meant to assist EAF facilities in weaving environmental decision making into the fabric of the way they do business. The purpose is not only to achieve better compliance assurance, but also to improve environmental performance in areas such as air emissions, energy and water-use efficiency, wastewater, and hazardous and non-hazardous waste reduction. As a result of comprehensive planning, rigorous implementation, regular checking, and effective corrective action, an EMS helps facilities to consistently meet their environmental goals and commitments. **EAF facilities that have an effective EMS are becoming more efficient and more competitive**.

> *"Performance Track is an attractive option for steel manufacturing facilities. It offers regulatory flexibility as one of its benefits, and we continue to expand the membership incentives for all interested sectors."*
>
> Dan Fiorino, Director, EPA National Environmental Performance Track Program

Most EAF facilities have components of an EMS already in place. This EMS Guide encourages the user to identify and build on existing components whenever possible. It describes a plan-do-check-act model of EMS that is based on the elements of the "*International Organization for Standardization 14001: 1996 Technical Specification and Guidance for Use* (ISO 14001)"[1] and the "*ISO 14001: 2004 Final International Standard"* and incorporates EPA's National Environmental Performance Track (Performance Track) emphasis on sustained compliance, pollution prevention, and information sharing with the community (see discussion below). Though there are other types of EMSs that one could adopt, and EPA does not specifically endorse any individual EMS standard, the ISO 14001 EMS is the most widely recognized and one that many companies are beginning to require their suppliers to adopt. Therefore, moving in the direction of implementation and maintenance of an EMS based on ISO 14001 may be a wise business decision. The choice to develop an EMS that, if desired, could be certified in the future, may make sense for you based on your business goals and needs. Facilities implementing an EMS that meets the requirements of ISO 14001 can either self-declare conformance or seek third-party registration.

[1] ISO 14001: 2004 Environmental Management Systems -- Specification with Guidance for Use can be purchased from the Products and Services page of the ISO Web site for a nominal fee. Copies are available electronically and in hard copy. http://www.iso.org/iso/en/prods-services/ISOstore/store.html

Your company also can seek to be qualified as a member of Performance Track[2]. Performance Track is a voluntary program in which the EPA rewards both public and private facilities that maintain environmental compliance, continuously improve environmental performance, and communicate proactively with their communities. Performance Track members receive several benefits for meeting the criteria.

There are differences between ISO 14001, an international standard for EMS, and the Performance Track EMS criteria. Performance Track has criteria related to continuous improvement in environmental performance and communicating internally and externally information on EMS performance that ISO 14001 lacks. This difference means that the two have different requirements for the environmental policy, objectives and target, communications, and management review elements. Also, Performance Track directs facilities to pursue "continuous" improvement in environmental performance, whereas ISO 14001 only requires "continual" improvement not specific to environmental performance. A continuous (i.e., uninterrupted) improvement criterion exceeds a continual (i.e., regular, recurring, and frequent) improvement requirement. Facilities with an ISO 14001-conformant EMS likely meet the Performance Track EMS criteria if a few additional items were to be address in their EMS. These additional criteria and also the ISO 14001 requirements that go beyond Performance Track are provided in ***Section I: Appendix B***.

## Benefits of Performance Track Membership

- Low priority for routine Federal inspections
- EPA recognition including membership certificate, listing on the EPA Web site and inclusion in trade journal feature articles and EPA-funded "best practices" database
- Ability to market facility participation in the program through use of the Performance Track logo
- Increased access to senior EPA officials
- A network of Performance Track members with whom to share best practices
- Access to regulatory changes that reduce reporting and other administrative costs

*"Our EMS, and our participation in US EPA's Performance Track Program, has helped us identify and focus on goals that are good for the environment and good for business. That's a winning combination."*

Steve Green
Environmental Manager
Nucor Steel Auburn, Inc.

Several States also have voluntary environmental performance programs. Performance Track currently has Memoranda of Agreement with Colorado, Georgia, Maine, Massachusetts, Tennessee, Texas, Utah, Virginia, and Washington. If you wish to learn more about these programs go to http://www.epa.gov/performancetrack/partners/index.htm and visit the link to State Programs.

[2] A facility can formally apply for Performance Track by submitting the application form on the Web site at www.epa.gov/performancetrack or by calling the Performance Track Information Center at 888-339-PTRK. Applications are accepted twice a year.

## What Is an Environmental Management System?

An EMS provides the organizational structure and procedures for managing your facility's environmental issues and continuously improving its environmental performance.

> *"An EMS is a business approach whose time has come. Our EMS improves performance by helping to keep compliance and procedures consistent between multiple facilities and helps boost awareness of environmental issues within our organization."*
>
> Matt Schroeder
> Environmental Engineer
> Charter Steel

## Why Implement an EMS?

Developing an EMS is strictly voluntary. Carrying out an EMS has inherent benefits, and in addition, your facility can receive regulatory incentives at both the State and Federal Level. See http://www.epa.gov/sectors/ or contact your SSP Iron and Steel Manufacturing Sector point of contact for more information concerning these incentives. An EMS for your facility will reduce risk and liability, increase efficiency in using environmental resources, and facilitate compliance with environmental rules. An effective EMS improves performance by helping your facility to achieve the following benefits:

- Reduce costs
- Improve environmental compliance
- Prioritize environmental issues
- Identify potential problems
- Use materials more efficiently
- Streamline operations
- Improve internal communication
- Support compliance with Sarbanes-Oxley (see Element 15. Management Review) and "good corporate governance" standards
- Enhance workforce morale

## What are the basics of an EMS?

The following fifteen elements (this EMS Guide combines some of the 17 ISO 14001 elements while maintaining all of the standard's requirements) provide an overview of an EMS.

> *"An EMS's systematic approach offers a continuity of performance, even in the face of increased turnover and provides ownership at all levels helping to promote employee engagement. Our EMS has also delivered significant dividends with regard to public and community relations. Our neighbors care about our environmental stewardship and through our EMS, we have a better standing in the community."*
>
> John (Jack) R. Skelley
> Regional Environmental Manager
> Gerdau Ameristeel Wilton

1. *Scope, resources, roles, responsibility, and authority*—Define the EMS scope, establish roles and responsibilities for environmental management, and provide appropriate resources.
2. *Environmental policy*—Develop a statement of your facility's commitment to compliance applicable requirements,

pollution prevention, and continuous improvement. Use this policy as a framework for planning and action.

3. *Environmental aspects*—Identify environmental aspects of your products, activities, and services and determine those that could have significant impacts on the environment.
4. *Legal and other environmental requirements*—Identify and ensure access to applicable laws and regulations, as well as other environmental requirements to which your facility subscribes.
5. *Objectives, targets, and programs*—Establish environmental goals for your facility, in line with your policy, environmental impacts, legal requirements, the views of interested parties, and other factors, and plan actions necessary to achieve your objectives and targets.
6. *Competence, training, and awareness*—Ensure that workforce members are trained and capable of carrying out their environmental responsibilities.
7. *Communication*—Establish processes for internal and external communications on environmental management issues.
8. *Documentation and control of documents*—Maintain information on your EMS and related documents. Often this EMS information is assembled to create an EMS manual, either in hard copy or electronic form. Ensure effective management of procedures and other system documents.
9. *Operational control*—Identify, plan, and manage your operations and activities, including those associated with subcontractors, in line with your policy, objectives, and targets.
10. *Emergency preparedness and response*—Identify possible emergencies and develop procedures for preventing and responding to them.
11. *Monitoring, measurement, and evaluation of compliance*—Monitor key activities and track performance. Conduct periodic assessments of compliance with legal requirements.
12. *Nonconformity, and corrective and preventive action*—Identify and correct problems and prevent their recurrence.
13. *Records*—Maintain and manage records of EMS performance.
14. *Internal audit*— Periodically verify that your EMS is operating as intended.
15. *Management review*—Periodically review your EMS with an eye to continual improvement.

## User's Guide

**An EMS should help your facility focus on results, not on paperwork.** Anything you do in developing an EMS should contribute toward reducing risk of environmental harm, improving environmental performance, and making it easier to comply with legal requirements. This EMS Guide will help you accomplish these objectives.

*"Implementation of an EMS at V&M STAR has proven to be highly beneficial through identifying and minimizing environmental risks, increasing environmental awareness at all levels, improvements in waste recycling, and providing for effective and efficient management of the environment."*

Jeff Bindas
Environmental Manager
V&M STAR

***Section I: EMS Guidance*** describes a plan-do-check-act EMS model divided into fifteen elements and recommends what a facility should do to establish each element in a suitable and effective way. It has the following format:

- What (describes what the element is)
- Who (identifies the person in charge of the element)
- Why (explains reasons the element is important to an EMS)
- How (illustrates the way the element is created)
- Summary checklist (presents a step-wise approach to fulfilling the element)

***Section II: EMS Documentation*** is divided into three tiers (the term "tier" is common used to refer to different levels of management system documents (e.g. Tier I documents are the management system policy and manual, Tier II are procedures that apply generally across an organization, and Tier III are job-related instruction that apply to only a subset of the organization). ***Section II, Tier I***, presents a Sample EMS Manual for a hypothetical facility called EAF Steel Company. EAF Steel Company's EMS Manual describes the main elements of the management system and their interaction and provides direction to related documentation. ***Section II, Tier II*** provides example procedures and forms that are necessary to an EMS. ***Section II, Tier III*** provides some example work instructions.

Also provided in ***Section II*** are **exhibits that offer** examples of how EAF Steel Company might document and record certain elements of its EMS. Revising these examples should be much easier for your facility than starting with a blank page. However, when using them, it is crucial to review the requirements of your facility in accordance with company policies and the most recent federal, state, and local requirements. Further guidance in establishing an EMS can be acquired from Technical Assistance Providers (TAPs). A list of TAPs is found in ***Section I: Appendix C***. However, EPA does not specifically endorse any products or commercial services mentioned in this guide.

Additionally, a glossary of terms used throughout this EMS Guide is found in ***Section I: Appendix D***.

## Using This Model to Create Your EMS

Keep the following things in mind as you plan your EMS:

- **Start small.** Don't take on the world.
- **Incorporate your existing systems.** For example, if you already have a system for documentation, develop your EMS manual to incorporate that existing system. It makes sense to use whatever system you normally use for developing and maintaining similar documentation.
- **Establish top management commitment.** Making the environment an organizational priority and providing adequate resources are the job of top management. To initiate and sustain the EMS effort, top management must communicate to employees the importance of integrating environmental management throughout the facility (thinking about the environment as part of product/service and process development and delivery, among other activities).

- **Make your EMS results oriented.** Your EMS should reduce risk, assure compliance, and improve performance. Make your EMS good for business and for the environment.
- **Pick an appropriate level of detail.** Consider the size of your facility as you plan your EMS. In general, the larger the company is, the more detailed its procedures tend to be.
- **Plan for flexibility.** Design your EMS so that, over time, it will continue to be used and adapted. It is very important that your EMS change and improve with your business. A worthwhile EMS is not a manual that collects dust, but instead a dynamic tool that grows and changes with your operations, providing enhanced results well into the future.