Learning From the Solutia EMS Experience

Implementing an Environmental Management System at the Solutia, Inc. Indian Orchard Plant in Springfield, Massachusetts

Authors:

Janet Clark, Senior Associate Director, Toxics Use Reduction Institute, Lowell, MA
Jeff Collins and Roy Hart, Solutia, Inc. Indian Orchard Plant, Springfield, MA
Chuck Mason, CHMM, Gannett Fleming, Inc., Richmond, VA

TURI
Toxics Use Reduction Institute
University of Massachusetts Lowell
One University Avenue
Lowell, Massachusetts 01854-2866
978.934.3275 fax: 978.934.3050
www.turi.org

Toxics Use Reduction Institute at UMass Lowell, 978-934-3275, www.turi.org

TABLE OF CONTENTS

Executive Summary

The Solutia, Inc. Indian Orchard Plant in Springfield, Massachusetts (Solutia IO) is currently improving an existing environmental management system (EMS) and certifying it to the ISO 14001 standard, primarily because its customers are demanding it. In the fall of 2004, Solutia IO received a grant from the Massachusetts Toxics Use Reduction Institute (TURI) to host a series of meetings for a work group of peers -- lead staff from other Massachusetts companies working on EMS projects. At that time, Solutia IO hired experts from Gannett Fleming and began an aggressive program of gap analysis, planning, documentation and training to prepare for the third party audit. Although the EMS team realized that its proactive environmental programs already met many ISO 14001 requirements the team uncovered shortcomings in key environmental areas. The project has lead to improvement in the plant's environmental performance while reducing its risks, and the TURI peer mentoring work group proved valuable in fielding ideas and comparing best practices. In 2005, the plant was among the select group recognized by the State of Massachusetts' Toxic Use Reduction Institute (TURI) as a "Champion of Toxics Use Reduction" for its leadership in the industry Peer Mentoring EMS Work Group.

> "The group brings credibility and concrete examples to go back to my boss and say this is standard business practice and we need to be doing this."
> *Solutia TURI EMS Work Group Participant*

Introduction

Solutia Environmental Program

Solutia is a leader in environmental stewardship, and has developed a corporate-wide environmental and safety policy (see next page) for all of its business units to follow. This policy emphasizes open communication with all stakeholders, active employee involvement, and adoption of new technologies to continuously improve environmental performance. In addition, the policy references specific programs developed by Solutia to ensure that these policy commitments are realized, such as the creation of community advisory panels and other programs.

The Solutia Facility

Solutia, Inc. is a global corporation, with more than $3 billion in annual sales and more than 9,000 employees located at 35 manufacturing sites in 30 countries. Solutia is a leader in developing chemical application solutions for its customers, including manufacturing laminated safety glass, performance films, pharmaceutical chemicals, water treatment chemicals, heat transfer fluids, aviation hydraulic fluids, and nylon products.

Solutia Indian Orchard Plant Environmental Policy

Policy: Pollution Prevention: The Solutia Indian Orchard Plant, a manufacturer of **Saflex** automotive and architectural interlayer, **Butvar** resin, **Resimene** coatings and **Gelva Adhesives** is committed to conducting our operation in a manner that prevents pollution and conserves resources. This commitment supports our overall mission to create value for our local communities, our employees and our customers.

Continual Improvement: The Solutia Indian Orchard Plant will strive for the continual improvement of our environmental performance by reducing the impact of our environmental aspects and by improving our Environmental Management System.

Legal Compliance: The Solutia Indian Orchard Plant will ensure compliance with all federal, state and local community regulations. We will work with government leaders, agencies and other organizations to be aware and have influence in emerging issues. We pledge to operate our businesses according to the American Chemistry Council's Responsible Care Initiative.

Communication: This Policy will be communicated to all Solutia Indian Orchard Plant employees and Guest Operations to help foster environmental responsibility. This Policy is available to the public.

Purpose: This Policy demonstrates our commitment to the protection and enhancement of the environment in which we all live. This Policy provides a framework for setting and reviewing our environmental objectives and targets.

Responsibility: The Plant Manager of the Solutia Indian Orchard Plant and his or her Site Management Team are responsible for the implementation and maintenance of this Policy.

Supporting Documentation: Solutia Indian Orchard Plant Environmental Policies and Procedures which document our good management practices.
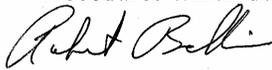
Robert Bellerive
President, Local 414

Russell F. Sackett
Plant Manager
September, 2005
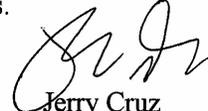
Jerry Cruz
President, Local 288

A 180-acre site in Springfield, Massachusetts is home to one of Solutia's major manufacturing operations and is the Global Research & Development Center for its Performance Products Division. The Solutia IO has been in continuous operation since 1904, and has grown to be New England's largest chemical plant. One of the plant's most renowned products is Saflex® plastic interlayers, which help protect people by strengthening the glass found in cars and buildings worldwide. The facility also manufactures Butvar® resin used for coating and adhesive applications, Resimene® amino crosslinkers used for liquid thermosetting surface coatings for automotive paints and industrial applications, and Gelva® adhesives and specialty resins used in the graphics, solar, medical, automotive and packaging industries.

> One of the plant's most renowned products is Saflex® plastic interlayers, which help protect people by strengthening the glass found in cars and buildings worldwide.

The plant employs approximately 550 people. Among its staff are highly skilled chemists, chemical engineers, and research scientists. Solutia's annual payroll is in excess of 50 million dollars and each year the plant does more than 26 million dollars worth of business with Massachusetts vendors. The Indian Orchard Plant serves customers around the world in many different industries.

Solutia IO is an active participant in the Indian Orchard Community Advisory Panel, which consists of industry and neighborhood representatives dedicated to discussing environmental and other community issues. Solutia Indian Orchard employees are involved in many community and civic activities, including Indian Orchard Main Street Partnership, Safety Council of Western New England, Massachusetts Chemistry and Technology Alliance, and the Western Massachusetts Industrial Hygiene Association.

Toxics Use Reduction and Recycling

Solutia IO has shown responsible environmental management of its operations, and has developed many innovative processes and programs to reduce its environmental impact. Among its significant accomplishments:

- Reducing Toxic Release Inventory (TRI) reportable emissions to the air, water, and land by 75% since 1987, while increasing production rates.
- Reducing TRI air emissions by nearly 90% since 1987.

Reduction in Use of Toxic Chemical
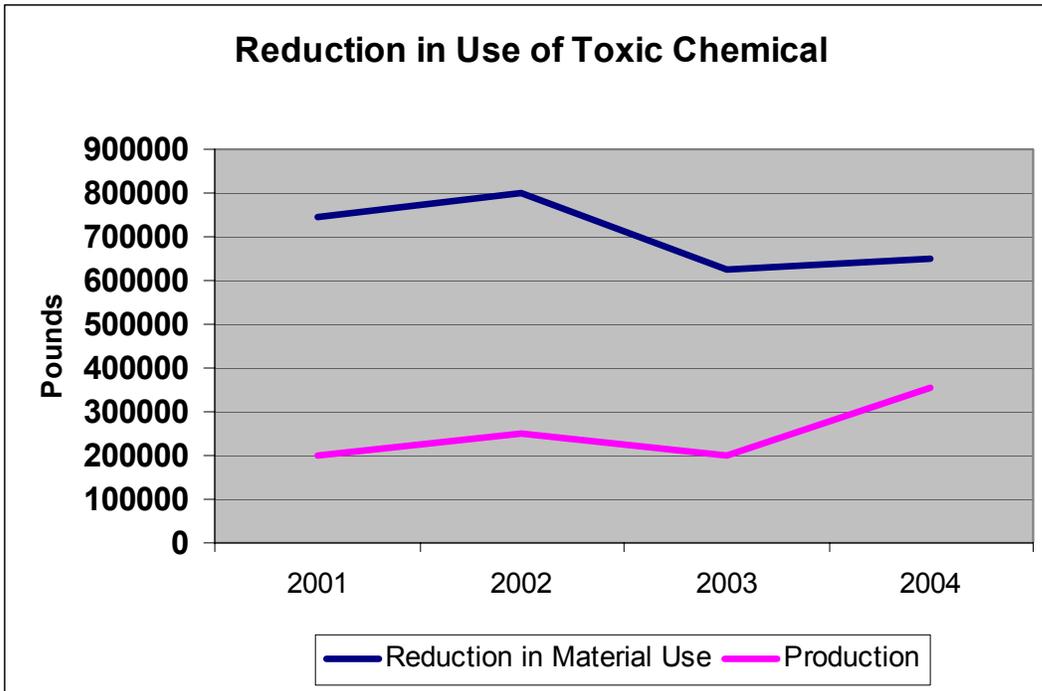
Figure 1a – For this toxic chemical, Solutia reduced use by one million pounds annually in 2002, and an additional ½ million by 2004.

Reduced Water Use

Figure 1b– For this production unit, Solutia reduced process water use by about one million gallons annually, while increasing production by about 7% in 2002.
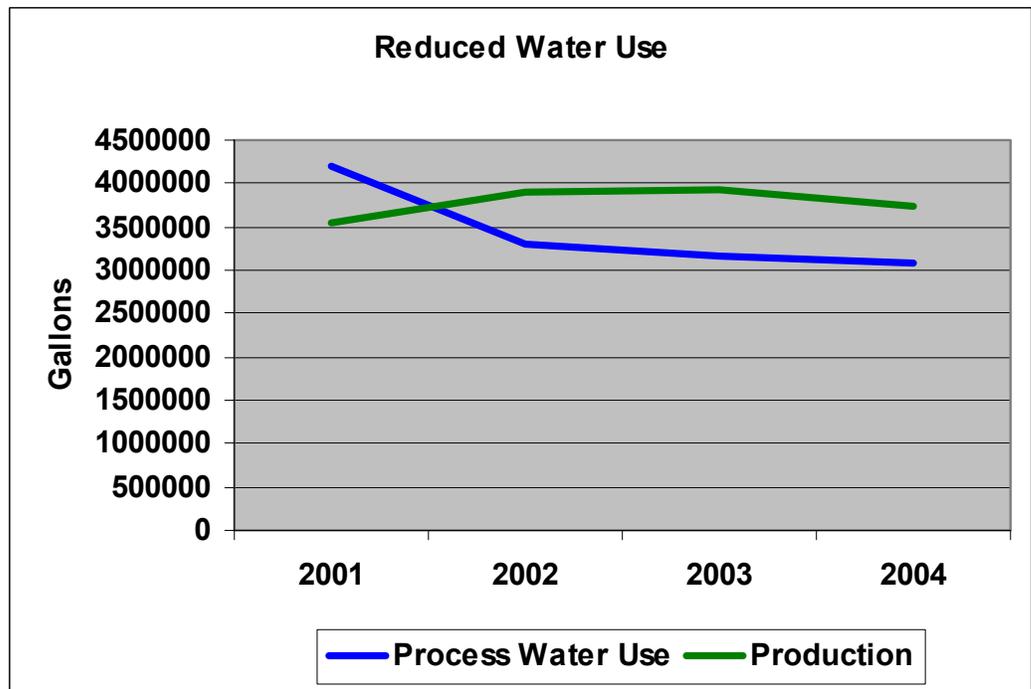
Figure 2a – For this second production unit, Solutia reduced annual use of a toxic chemical by 175,488 pounds, and maintained this performance while production rose the following year.

Reduction in Use of Toxic Chemical

Pounds

5000000
4000000
3000000
2000000
1000000
0

2001 2002 2003 2004

—— Reduction in Material Use   —— Production

Reduced Air Emission and Water Use

Pounds

7000
6000
5000
4000
3000
2000
1000
0

2001 2002 2003 2004

—— Air Emissions   —— Process Water Use   —— Production

Figure 2b – For this second production unit, Solutia reduced stack and fugitive emissions by 1010 pounds and water use by about 20% in 2002, while production was at a steady rate.

Solutia has also focused its waste reduction efforts on reuse and recycling and associated process changes. For example, in 1992 the plant was an early user of biofilters, which helped reduce air emissions from one unit by over 250,000 lbs per year. Also in the 1990's, Solutia IO substituted less toxic propylene glycol in place of ethylene glycol in many package heat exchange units and modified one of its unit processes to reduce solvent wash volume by 20%.

Additional changes were made to re-use the last wash in the cycle. Another process change involved working with the U.S. Environmental Protection Agency (in 1994) to recover Methanol Rich Distillate (MRD) for re-use in the process. This resulted in the elimination of over 5 million pounds of hazardous waste per year, and discharges to the process sewer system were reduced by over 2 million pounds per year as well. Finally, the plant instituted a leak detection and repair program, with a leak repair threshold 20 times lower than regulations required.

> Solutia IO substituted less toxic propylene glycol in place of ethylene glycol in many package heat exchange units and modified one of its unit processes to reduce solvent wash volume by 20%.

In addition to its environmental commitment, the plant also has a strong safety program. It has been recognized as a VPP "Star" site, OSHA's highest level of recognition f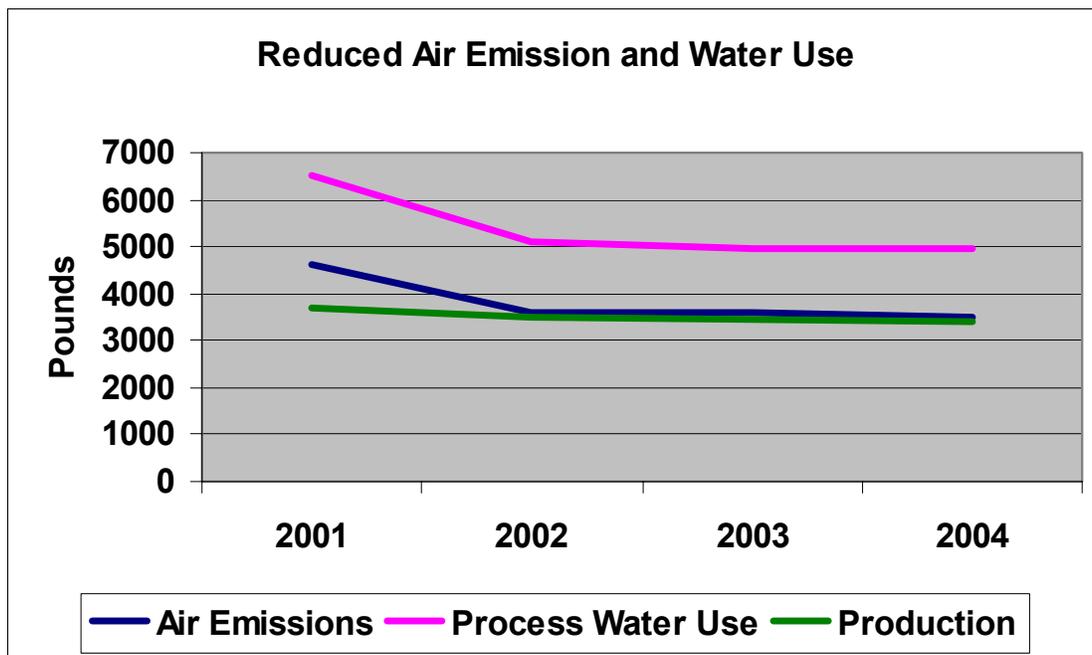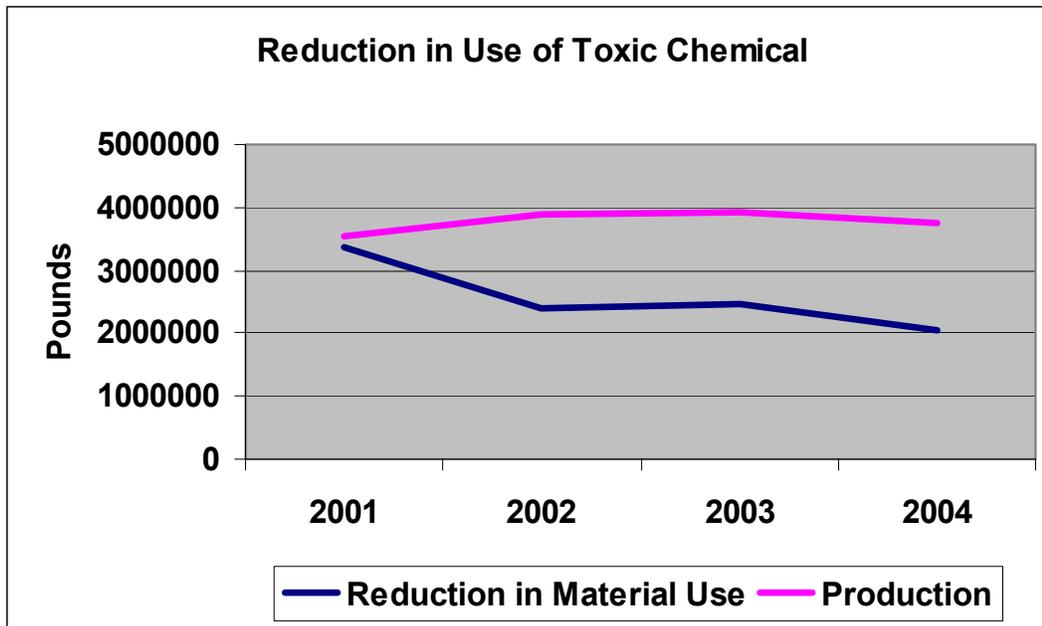or excellence in voluntary safety and health programs. The plant is also dedicated to quality, having achieved ISO 9001 and TS-16949 quality management system registrations.

Key Environmental Receptors

Because of the IO plant's proximity to both human and ecological receptors, the Solutia IO understands the importance of being seen as a good steward in the community. The plant borders the Chicopee River which has the largest drainage basin of all rivers in Massachusetts[1] and is popular for fishing and other recreational uses. A residential area borders the plant to the west, with other many other residences in the general vicinity. The Massachusetts Turnpike (I-90), a major east-west artery through Massachusetts, is within sight of the facility.

Key Environmental Risks and Controls

In order to manufacture plastic interlayers and other products, Indian Orchard plant production involves using and handling many types of chemicals. If not managed properly, some of these chemicals can cause fires, spills, or other environmental hazards. Key environmental risks, and programs the plant has put in place to manage them, include:

- **Air emissions**. The plant has been designated as a major source of air emissions. To control these emissions, the plant has installed a variety of condensers, scrubbers, and a biofilter. The plant maintains a vigorous leak detection and repair program to eliminate fugitive emissions from tanks, valves, and pumps.
- **Wastewater Discharges.** The plant operates its own wastewater pre-treatment plant, and discharges this treated wastewater to the City of Springfield publicly owned treatment works.
- **Stormwater Discharges.** The plant maintains separate storm sewers and process sewers, which are color coded, to ensure that only stormwater is discharged to the Chicopee River,

in accordance with the plant's NPDES stormwater discharge permit.

- **Hazardous Waste.** The plant maintains a permit with the Massachusetts Department of Environmental Protection to store hazardous waste in 55-gallon drums for up to one year before it is taken offsite for proper disposal.

> "It is a good reference point to find where you are compared to others."
> *Solutia TURI EMS Work Group Participant*

- **Accidental Spills.** The plant has implemented an aggressive spill prevention and response program. The plant's onsite fire brigade and hazardous materials response team train regularly and perform at least one emergency response drill annually.

Plant and EMS Organizational Structure

The plant is led by a Plant Manager and 10 Business Unit Leaders who make up the Site Management Team. Each Business Unit Leader is responsible for a particular product line or administrative function at the plant. As diagrammed in Figure 3, the Environmental, Safety, and Health (ESH) Lead is part of the Site Management Team. ESH Department members report directly to the ESH Lead. ESH Coordinators serve as the primary point of contact for environmental issues within their manufacturing business units. However, the ESH Coordinators are

FIGURE 3
SOLUTIA EMS STRUCTURE

Plant Manager

Management Representative
(ESH Lead)

Environmental Lead

ESH Coordinator | ESH Coordinator | Environmental Professional | Environmental Professional | ESH Coordinator | ESH Coordinator | ESH Coordinator

Legend
——— Direct Reporting and EMS Responsibility
- - - - EMS Responsibility Only

part of their individual business units and do not report to the ESH Lead.

The plant structured its EMS based on its overall organizational structure. The Plant Manager is ultimately responsible for EMS performance. The ESH Lead serves as the EMS management representative, who is responsible for implementing and maintaining the EMS at the plant. The ESH Lead is supported by the Environmental Protection Lead, who is responsible for the daily management of the EMS. In addition, the ESH Coordinators play a critical role in supporting the EMS within their own departments through providing training and ensuring that department level EMS documentation is accurate and complete.

Why An EMS?

The Site Management Team realized that an ISO 14001-conformant EMS, certified by an independent third party, would add greater discipline and sustainability to its environmental program. However, there was no market advantage seen to justify the additional expense.

It wasn't until the plant's direct customers began inquiring about ISO 14001 that the plant realized that EMS implementation would likely become a requirement in the future. The plant applied for and received a TURI EMS matching
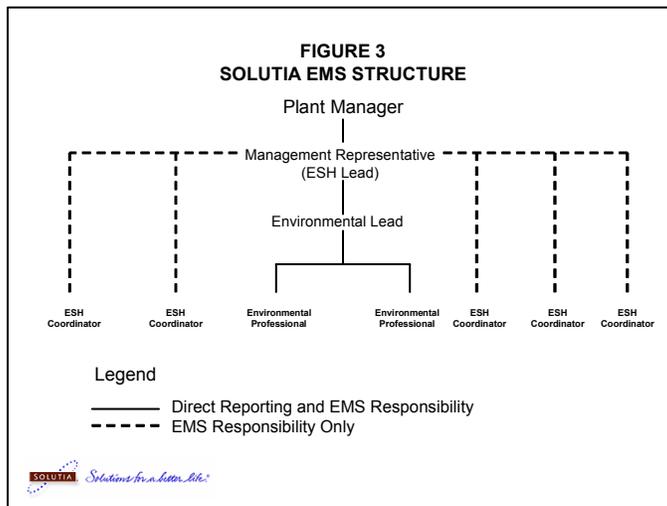
grant. Solutia IO's obligation under that grant was to pursue an EMS project, recruit work group participants from Massachusetts industry, and prepare for and host a series of peer mentoring events at its facility. With this support, Solutia IO set a goal to develop the plant's environmental program by implementing an ISO 14001-based EMS.

The second decision was whether to certify its EMS to ISO 14001 through a third party independent registrar. The plant had the option to self-certify its EMS, since ISO 14001 does not require third party verification. The Site Management Team decided that having this independent certification would give the EMS more credibility with regulatory agencies, its customers and the general public.

Lessons Learned from the TURI EMS Peer Work Group

As the plant began EMS implementation, it held monthly meetings at the plant with representatives from TURI and other local firms that were also implementing

Solutia/TURI Work Group Participants	
Company Name, location	**Company EMS Goals**
Solutia, Springfield, MA	Prepare for third party audit
NovaChemicals, Springfield, MA	Interpret corporate EMS manual for this facility
GreenMountain Coffee Roasters,Waterl Vermont	Complete legacy EMS effort
Lane Construction, Northfield, MA	Complete legacy EMS effort
Judd Wire, Turners Falls, MA	Explore EMS for this facility
Titeflex Corporation, Springfield, MA	Explore EMS for this facility

or considering an EMS. This TURI Work Group consisted primarily of environmental managers who were implementing or improving their EMS process. Business reasons for involvement included strategic positioning for preferred trading partner status, maintenance of environmental leadership position, risk control, and pressure from state or federal regulators. Participating companies also set EMS goals, reflecting the range of experience in the room.

Six Focus Areas for Success

The work group used a quick self-assessment tool provided by TURI to select meeting topics that most members would find valuable. Before each meeting, Solutia distributed an agenda. Work group members brought their own specific questions or ideas based on the agenda, which helped add structure to the meetings. In spite of the variation of company sizes, sectors, and EMS maturity, many members were facing the same issues and discussed strategies to effectively overcome them. The work group members learned the following:

1. **Document procedures that are already being followed in your facility.** Since many work group members were already doing the right things, they found that many ISO 14001 requirements were already fulfilled. For example, many organizations had emergency response plans or spill plans that could serve as the basis for the EMS emergency response procedure.

2. **Make the EMS adapt to your business by incorporating what is already working well.**

3. **Keep environmental aspect significance determination simple.** The work group discussed criteria typically used in determining environmental aspect significance, and the benefits of selecting certain criteria over others. Focus on those criteria that are of greatest concern to your organization, such as risk or public concerns.

4. **Encourage involvement from others in your organization to generate ideas on improving environmental performance.**

5. **Keep senior management actively involved in the EMS.** If you don't have senior management commitment, then the EMS is not worth doing.

6. **Ensure consistency in how environmental risks are managed through documentation.** However, keep the documentation short, simple, and **useable**.

> "The group has high value because it allows a perspective from outside the company. Gives a fresh look on questions often asked from within."
> *Solutia TURI EMS Work Group Participant*

Work Group Topics and Ideas Generated

The work group discussions were valuable because very specific and new ideas were generated. It was helpful to hear from other companies in diverse industries and to build on each other's ideas. The following table offers some examples of this exchange, and a more comprehensive account of these exchanges can be found in the appendix of this case study.

Work Group Discussion and Ideas		
ISSUE	QUESTION	EXAMPLES OF RESPONSES
Aspects Identification	How do you make a list of aspects?	• Have a regulatory column on your matrix, but include other aspects. • Even if you have an aspect under control it still needs to be part of EMS. • Anything that can come up that would have some opportunity for some kind of improvement. Not saying 100%. • Matrices are site specific. We have eight facilities and three plant managers. We also had plant mangers rank them and they approved or disapproved final results. We came up with ten different projects to do for the year. Some regions have more projects than others do. If it scores a certain score they will deal with it. • It is always good to focus in, look at the process so you can develop better operating procedures. • If you are not comprehensive in your aspect identification, system auditors may have an issue with your process for identification. • For us it works to do aspects for one department and just change the department name. For the most part aspects are all the same. What is significant differs from department to department.
Writing Procedures	How long are your standard operating procedures (SOPs)? How How do you write them?	• Each unit sets the format on how they do their SOPs. It is important to have what works for them so they follow the SOP. The standard format is what to address and the department prepares the procedure in their format but addresses what we require. Most of our department's SOPs are 40-50 pages. (TURI NOTE: this is unusually long) • Looked at our existing SOPs to see if they provide operation control to manage the process. We found some areas where we need to modify.
Integrating into Business Processes	How do you identify areas for actual procedure improvement? How do you integrate policy, procedure and work list with EMS?	• Look at PHA (Process Hazard Analysis) which is forward looking. However, if you just look in the procedure, people do not know why they are following this procedure. • The purpose of work instructions and a Management System is to integrate these into other Business Systems. Don't isolate or hand off responsibility. Take time to think about it, and use continuous improvement to get it to work better. • We are working with the VP of Operations to train Purchasing to only purchase what they need. • An integral part of our EMS is looking at high efficiency motors

Comments from work group participants were positive. Here are a few examples:

"There is a lot of talent in the room!"

"As someone who has been through this kind of meeting before, there was unusual openness of discussion and quality of the listening at today's meeting."

"Beginners give those improving their EMS a fresh look."

"I got really good feedback. The sharing part is valuable for me."

"It is a good reference point finding where you are compared to others."

"People brought tangible work."

"I think this is great. This group is more sophisticated so this gives me goals for the future."

"The group brings credibility and concrete examples to go back to my boss and say this is standard business practice and we need to be doing this."

"The group has high value because it allows a perspective from outside the company. Gives a fresh look on questions often asked from within."

"This is a good forum for discussing ideas on EMS implementation."

"Discussions are participatory, lively, and interesting."

"Good examples of programs that are beneficial and need an EMS vs. a compliance-based environmental program.

Steps to Develop an EMS

This section describes how Solutia IO went through the EMS implementation process. As with any long-term project requiring significant resources, planning was important to:

- Identify the strengths and weaknesses of the existing environmental program.
- Identify the environmental risks to be managed.
- Develop programs and procedures to properly manage those risks.
- Continuously monitor and improve environmental performance.

Steps identified for completing the project were as follows:

1. **Perform a gap analysis**
2. **Create an implementation plan**
3. **Consider Environmental Aspects**
4. **Perform EMS Implementation**
5. **Conduct Training**
6. **Check EMS Performance**

1. Perform Gap Analysis

The first step the plant performed was a gap analysis, which was simply a comparison of its existing environmental program against ISO 14001 requirements. Any element of the plant's current program that did not conform to ISO 14001 requirements was identified as a gap.

The gap analysis results showed that the plant had a very proactive environmental program, particularly in areas of objectives and targets, training, corrective actions, emergency response, and planning for new projects. In addition, the plant had invested in an innovative, plant-wide electronic document control system and a computer-based training system, both of which were recommended for use in developing the EMS. Although the plant had proactive programs in place,

there was a lack of consistency in some environmental program areas. For example, in some cases documented procedures were developed but not always followed, and in other cases documented procedures had not been developed to meet certain ISO 14001 requirements.

For example:

- The plant had developed a procedure for performing environmental compliance audits, but did not rigorously follow this procedure as documented.

> "I think this is great. This group is more sophisticated so this gives me goals for the future."
> *Solutia TURI EMS Work Group Participant*

- The plant did not have procedures in place for a management review of the environmental program.

- There was no procedure for responding to external environmental communications, although there was a procedure to respond to general external communications.

- It was not possible to determine whether documents and records were properly controlled because there was no central location to show what documents were required or where they were supposed to be maintained.

In addition, some environmental responsibilities had been delegated to the business unit level, and the ESH department could not demonstrate that those responsibilities were being met.

2. Create an Implementation Plan

The gap analysis results were incorporated into Solutia's EMS implementation plan, developed by Solutia's EMS consultant. This plan, which proved to be a valuable tool, documented 24 specific tasks to be completed in order to have the EMS fully implemented and certified by December 31, 2005.

Each task described in the plan contained a recommended action for efficient task completion. This plan also contained a Gantt chart, which showed deadlines for each task and the relationship between tasks. At a glance, Solutia's EMS management representative could use the Gantt chart to determine whether he was on schedule with EMS implementation and to identify upcoming tasks. This Gantt chart and the 24 tasks for EMS implementation are shown as Figure 4 below.
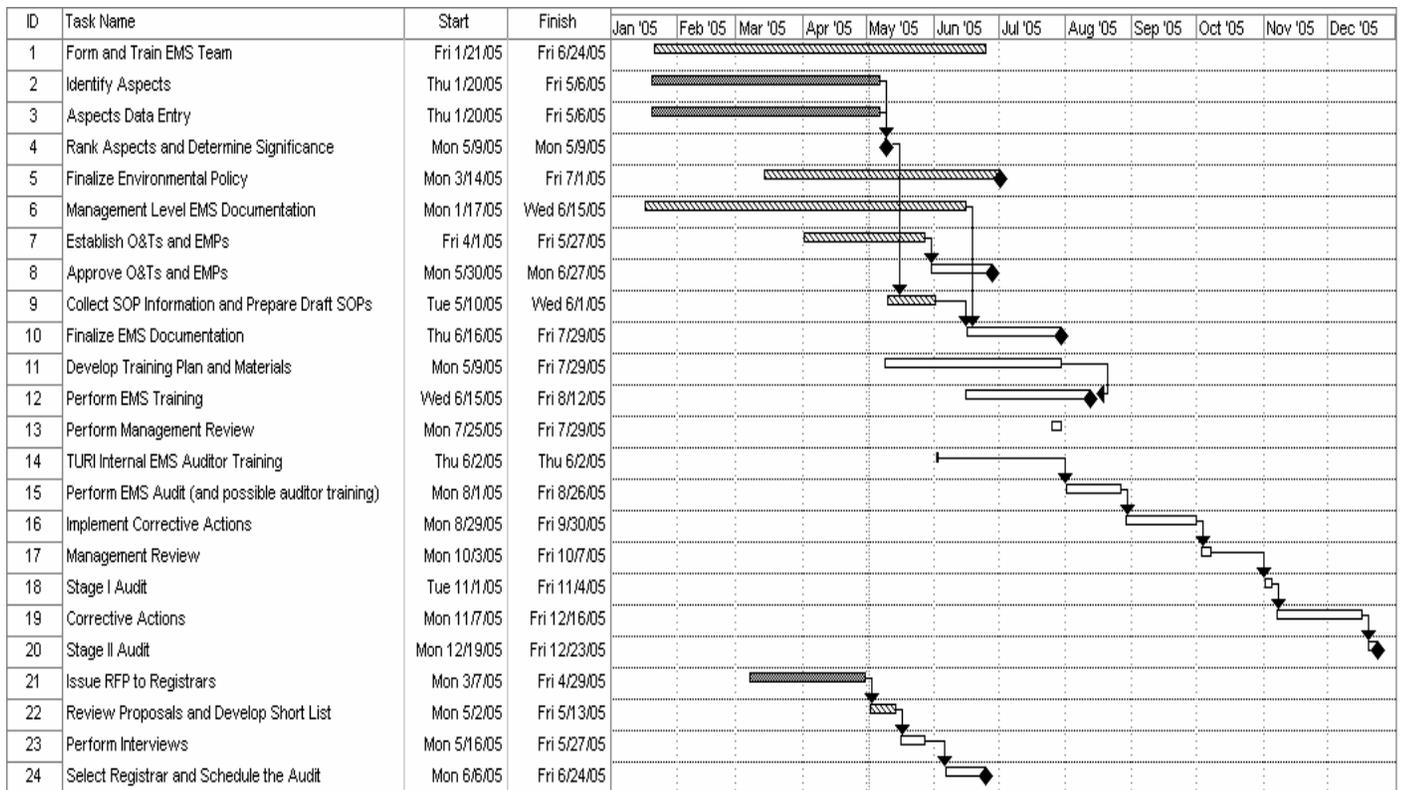
ID	Task Name	Start	Finish
1	Form and Train EMS Team	Fri 1/21/05	Fri 6/24/05
2	Identify Aspects	Thu 1/20/05	Fri 5/6/05
3	Aspects Data Entry	Thu 1/20/05	Fri 5/6/05
4	Rank Aspects and Determine Significance	Mon 5/9/05	Mon 5/9/05
5	Finalize Environmental Policy	Mon 3/14/05	Fri 7/1/05
6	Management Level EMS Documentation	Mon 1/17/05	Wed 6/15/05
7	Establish O&Ts and EMPs	Fri 4/1/05	Fri 5/27/05
8	Approve O&Ts and EMPs	Mon 5/30/05	Mon 6/27/05
9	Collect SOP Information and Prepare Draft SOPs	Tue 5/10/05	Wed 6/1/05
10	Finalize EMS Documentation	Thu 6/16/05	Fri 7/29/05
11	Develop Training Plan and Materials	Mon 5/9/05	Fri 7/29/05
12	Perform EMS Training	Wed 6/15/05	Fri 8/12/05
13	Perform Management Review	Mon 7/25/05	Fri 7/29/05
14	TURI Internal EMS Auditor Training	Thu 6/2/05	Thu 6/2/05
15	Perform EMS Audit (and possible auditor training)	Mon 8/1/05	Fri 8/26/05
16	Implement Corrective Actions	Mon 8/29/05	Fri 9/30/05
17	Management Review	Mon 10/3/05	Fri 10/7/05
18	Stage I Audit	Tue 11/1/05	Fri 11/4/05
19	Corrective Actions	Mon 11/7/05	Fri 12/16/05
20	Stage II Audit	Mon 12/19/05	Fri 12/23/05
21	Issue RFP to Registrars	Mon 3/7/05	Fri 4/29/05
22	Review Proposals and Develop Short List	Mon 5/2/05	Fri 5/13/05
23	Perform Interviews	Mon 5/16/05	Fri 5/27/05
24	Select Registrar and Schedule the Audit	Mon 6/6/05	Fri 6/24/05

Figure 4 EMS Gant Chart

3. Consider Environmental Aspects

The next task in planning the EMS implementation was identifying environmental aspects across the plant and determining significance. Per ISO 14001, an environmental aspect is any type of environmental interaction, positive or negative, from the plant's activities. To identify aspects, EMS team members visited each area within the scope of its EMS and documented environmental aspects. These aspects, identified at the building or process level, were grouped into aspects associated with air emissions, wastewater, hazardous waste, solid waste, energy or natural resource usage, or other.

Significant aspects are defined as those aspects that must be incorporated into the EMS because of their potential environmental impact. The plant developed a procedure to determine significance of each aspect based on a combination of five significance criteria and the different levels of scoring as shown below:

- Cost or potential cost to Solutia on an annual or per event basis

  > 0 — Low (<$5,000)
  > 2 — Medium (<$25,000)
  > 5 — High (>$25,000)

- The overall degree that an aspect is regulated.
  > 0 — Non-regulated aspect
  > 1 — Requires monitoring
  > 3 — Requires monitoring and
  >   routine reporting
  > 5 — Permitting required

- The degree of actual or potential environmental degradation based on the frequency and severity of the impact.
  > 1 — Negligible
  > 2 — Onsite

5 — Offsite, RQ exceeded, or reportable deviation

- Potential to cause a public concern.
    0 — None
    2 — Minor incident or ongoing operation
    5 — Significant impact – media coverage possible

- How much of a pollution prevention opportunity (dollars or volume) is presented by this aspect.
    0 — Low
    2 — Medium
    5 — High

Each aspect was then scored against all five criteria to yield a total score for each aspect. Then, a "cutoff" score of seven was established for all aspects. Any aspect that scored at or above this cutoff score was considered significant. This cutoff score was established based on professional judgment and the scoring range of all aspects identified. It ensured that all aspects that could pose a significant risk were ranked as significant. In addition, any aspect that scored at least one under the regulatory category required a documented standard operating procedure to properly manage it.

The following example illustrates how this scoring was applied. The plant generates waste oil, which is regulated as a hazardous waste in Massachusetts. It was scored as follows:

- Cost or potential cost to Solutia on an annual or per event basis
    2 — Medium (<$25,000)

> "The purpose of work instructions and a Management System is to integrate these into other Business Systems. Don't isolate or hand off responsibility. Take time to think about it, and use continuous improvement to get it to work better."
> ***Solutia TURI EMS Work Group Participant***

- The overall degree that an aspect is regulated.
    3 — Requires monitoring and routine reporting

- The degree of actual or potential environmental degradation based on the frequency and severity of the impact.
    5 — Offsite, RQ exceeded, or reportable deviation

- Potential to cause a public concern.
    2 — Minor incident or ongoing operation

- How much of a pollution prevention opportunity (dollars or volume) is presented by this aspect.
    0 -- Low

The total score for this aspect was 12. Therefore, since this score is above the cutoff score of seven, this aspect was considered significant. Even though this aspect occurred at several locations throughout the plant, each occurrence scored differently, primarily based on the volume stored and potential spill amounts.

4. Perform EMS Implementation

Implementing the EMS required effective leadership, clearly defined roles and responsibilities, an effective training program, and clearly documented procedures. Once the plant had its implementation plan and significant aspects in place, it could begin implementing its EMS. The Plant Manager designated the ESH Lead as the EMS Management Representative, who was in charge of implementing the EMS.

Others within the ESH staff played key roles as directed by the Management Representative, as did the ESH

Coordinators at the business unit level. The EMS Management Representative was clear that he wanted the EMS to adapt to how the plant did business. Since they were already doing many things well, these existing programs would simply be incorporated into the EMS.

One of the first tasks was developing the EMS documentation describing the EMS and how it will be managed on a daily basis. The plant developed a **Level 1 EMS Manual, Level 2 EMS Management Procedures, and Level 3 Standard Operating Procedures (SOPs).** The 20-page manual served to introduce the EMS and acknowledge each ISO 14001 requirement that the plant must meet. The manual also included the environmental policy, which was signed by the plant manager. The policy contained all of the ISO 14001 requirements and the plant's own requirements. Since the plant manager signed the policy, he helped develop and modify the policy to best suit the plant's operations.

The Level 2 procedures followed from this manual, but described <u>how</u> each ISO 14001 requirement would be met. There were a total of 13 procedures developed, each bout three to four pages long. Each procedure was titled after the ISO 14001 element that corresponded to it. In some cases, these procedures simply referenced other procedures or documents already in use that met the applicable ISO 14001 requirement.

Level 2 Procedure Documents:

4.3.1 Environmental Aspects

4.3.2 Legal and Other Requirements

4.3.3 Objectives, Targets, and Programs

4.4.2 Competency, Training, and Awareness

4.4.3 Communication

4.4.5 Control of Documents

4.4.6 Operational Control

4.5.1 Monitoring and Measurement

4.5.2 Evaluation of Compliance

4.5.3 Nonconformity, Corrective Action, and Preventive Action

4.5.4 Control of Records

4.5.5 Internal Audit

4.6 Management Review

Solutia IO's Environmental Policy Statement includes enough information to link it to their unique production and community environment, and commits to pollution prevention, continual improvement, legal compliance, and communication.

The policy also describes the facility's commitment to protect and enhance the environment, and the responsibility of the Plant Manager and the Site Management Team in implementing and maintaining this policy. It is signed by the plant manager and by the presidents of the two union locals present on the site.

(See Page 2)

The other ISO 14001 elements of environmental policy; resources, roles, responsibility, and authority; documentation; and emergency response are either addressed in the Level 1 manual or existing Solutia documents.

The creation of the level 2 procedures was one particular area where judgment was critical in determining the effectiveness of existing environmental programs and how best to integrate them with the EMS.

For example, the Environmental Protection Lead determined that the plant did not have a procedure for

responding to external environmental communications. By knowing how the plant operated and the key personnel involved, he developed a procedure that was integrated within the existing management structure. In some cases, developing these procedures involved discussing these requirements with others to determine the most effective means to meet them.

As the last and most time-consuming step in documentation preparation, the plant prepared Standard Operating Procedures (SOPs) or level 3 documents.

Per ISO 14001, each significant environmental aspect requires a documented SOP to prevent any significant environmental impacts from that operation. SOPs are written at the operational level and tell an operator how to perform a particular task and, just as importantly, why the task should be performed.

When first preparing its SOPs, the plant reviewed its existing SOPs and determined that many of them were already in place. Therefore, much of the effort involved updating them to reflect changes in operations and ensuring consistent formatting. In some cases, new SOPs were required. SOPs developed included those related to air emissions monitoring, hazardous waste handling, spill response, wastewater monitoring, and preventing storm water contamination.

Review of aspects revealed close alignment with existing improvement programs. Therefore, system improvement meant that selecting objectives and targets simply involved documenting programs that had already been selected for management approval. These programs were presented to the Site Management Team, who approved them based on the normal plant budget analysis process.

5. Conduct Training

After the EMS was documented on paper, all plant personnel were trained on the EMS. This training included all full- and part-time staff and full-time contractors. The Environmental Protection Lead developed the training content, which was divided into two categories, "General Awareness Training" and "Departmental Training."

> "Let everyone know their position has a responsibility in the EMS and protecting the environment."
> *Solutia TURI EMS Work Group Participant*

General Awareness Training included the following topics:

- General understanding of the EMS.
- Commitments outlined in the Environmental Policy. Copies of the policy were posted throughout the plant.
- What to do in the event of an environmental emergency.
- How to communicate environmental concerns or issues internally.
- How to respond to external environmentally-related communications.

Information about the plant's key environmental liabilities included the following:

- Air emissions control is required per the plant's permits and lead to improved air quality. Specific operations that should be controlled through SOPs were summarized, such as vent monitoring, scrubber operation, and loading/unloading operations.

- Hazardous waste is a high liability media and requires strict controls on its management and disposal. Key requirements such as labeling, storage, and disposal specified in the SOPs were discussed.

- There are differences between the storm and sanitary sewer. The importance of controlling discharges to each was reviewed through certain SOPs.

- Making changes in other waste streams that can reduce Solutia's environmental impact and improve profitability. The feasibility of either waste reduction or recycling was also discussed.

> "Higher level training is a challenge. For example, Operators should know why a failure of the refrigerator system is a problem because of ozone depleting substances, and not just place a call to Maintenance."
> *Solutia TURI EMS Work Group Participant*

General awareness training was performed through the plant's computer-based training (CBT) system. Because the plant had a strong CBT program in use for several years, it was relatively easy to ensure that everyone received the training and to document the training. In addition, the plant's existing emergency response and safety training program covered the emergency response training required as part of the EMS.

Departmental Training was competency-based and primarily involved training employees on new and modified SOPs, and possible objectives and targets, associated with their jobs. Since this training was specific to each department, the department supervisors or ESH Coordinators performed the training after the Environmental Staff had trained them. Each Solutia employee who had a significant aspect associated with their job was trained on:

- The significant aspect(s).
- Potential impact of not managing the significant aspect(s).
- Understanding and locating the SOPs for managing each significant aspect.
- That person's role (if any) in achieving an objective and target.

6. Check EMS Performance

On June 2, 2005, Solutia hosted the "Internal Auditing Your EMS" workshop offered by TURI. This training was open to the Massachusetts business community as well as the Solutia EMS team. The 29 participants received intensive instruction and practice in challenging, case study-based role-playing. The workshop prepares individuals to create internal auditing programs at their own facilities, a key element in EMS performance.

Next Steps for Solutia: Audit, Review and Certification

The Solutia plant will perform an internal EMS audit, scheduled for the end of November 2005. The audit team will include EHS department members, EHS Coordinators from the different department, and those who have experience in performing quality management system audits. The team will use pre-prepared audit questionnaires and interview an adequate cross-section of plant operations. To help ensure objectivity, auditors will not audit areas of the plant where they work.

As required by the ISO 14001 standard, the plant will also perform an Environmental Compliance Audit, which is different in scope from an EMS audit. This audit will involve verifying whether the plant was in compliance with all relevant federal, state, and local environmental regulations and related requirements. This audit will supplement the existing compliance audits performed by the corporate office.

The plant issued a detailed Request for Proposal (RFP) to three accredited registrars. Interviews are currently being conducted to help select the winning firm. Although the terms and requirements of ISO 14001 are defined, there remains room for auditor interpretation, particular regarding the 2004 version of ISO 14001. Therefore, the plant will evaluate its registrars based in part on their interpretations of the recent ISO 14001 revisions. Other key selection criteria will relate to audit mechanics, industry experience, qualifications, auditing style, and price. It is common for registrars to provide a formal presentation of their experience and qualifications free of charge as part of the registrar selection process, and Solutia will take advantage of this service to better select its registrar.

Results and Discussion

The TURI work group meetings provided a valuable forum to exchange ideas and learn from others' experience. After participating in the work group sessions, the Solutia Indian Orchard plant realized that they had already made significant progress in developing a fully functional EMS. However, the project also helped to identify areas for system improvement, which the plant is implementing to help ensure improved consistency and accountability in the environmental

function. The TURI work group hopes to continue meeting beyond the original schedule to track how others are doing with implementing their EMS.

A Draft Procedure for Internal Auditing and for Management Review is included in the Appendix of this case study.

	Solutia/TURI EMS Peer Work Group Discussions	
ISSUE	**QUESTION**	**EXAMPLES OF RESPONSES**
Contractors	How do you handle contractors and suppliers?	• We have on-site Purchasing Department that maintains the approved chemical list. He does their training for them. • Our first focus is here in our country. Once that is done we will go to off shore suppliers and bring up their standards. That will be our biggest long term challenge. • It is a challenge finding contractors that fall under our requirements of accident rates and level of insurance. We are asking them to have higher requirements than we currently have.
Aspects Identification	How do you make a list of aspects?	• Participants described specific activities with potential impacts, and give examples. • Our first priority is legal. More robust for our voluntary standard. Anything above tradition is an opportunity for improvement. • We looked at 148 aspects, 15 were significant. Packaging is on the list. • Consider resource balance. • Have a regulatory column. • Anything that can come up that would have something for some kind of improvement. Not saying 100%. • Matrices are site specific. We have eight facilities and three plant managers. We had plant mangers rank them and they approved or disapproved. We came up with ten different projects to do for the year. Some regions have more projects than others do. If it scores a certain score they will deal with it. • It is always good to focus in, look at the process so you can develop better operating procedures. • If you are not comprehensive in your aspect identification, system auditors may have an issue with your process for identification. • Even if you have an aspect under control it still needs to be part of EMS. • For us it works to do aspects for one department and just change the department name. For the most part aspects are all the same. What is significant differs from department to department.
Aspects Ranking	Ranking is difficult. How do you say one is more important than the other? All are critical.	• What needs attention soon and what makes sense to focus on this year should rank high. Make criteria so you are consistent, but the process needs to work for you. Projects have to be achievable in a year and have a positive result on business, production or in cost reduction. • Address severity of impact, frequency of impact, ability to complete a project. • It is a 2 step process 1) risk evaluation 2) what can be done with resources. Ten projects that were given to senior management during review period were paired down to five. We will look at the others next year. • Incidents and their severity are a troubling aspect. • Stakeholder concerns rank as big impacts. • Rate by how serious an impact it is on the Environment. Rank 1-5 on matrix rating chart, include Serious (toxic) / Resource Use / Extent (based on volume). Use the rating to set targets on what to focus on. You can add and multiply to get two different views of it.A push from their Parent Company on Safety and Environmental. • Not sure we have identified aspects right. We generate a generous aspect list with about 30 items, covering safety, environmental and mechanical management. Anything that has a check is scheduled a follow up. Every year we include new projects. Working backwards like this is subjective, can learn what is valid to your organization. • Of the 148 aspects from our last effort, we have done 40 and then pulled 20 off the list as pie in the sky.
Gap Analysis	What do you expect from a gap analysis?	• Our biggest gap is in monitoring and control. Our manual was written by Corporate who tried to fit every site. They have no idea of the nitty-gritty of processes they are writing about. • We have a 50-year old process, no Environmental Department until 2002, no computer for the foremen or manager's not accessing their computers. • Written regulations are few and far between and not followed very well. • We need to train behavior. The Maintenance Manager is not holding people accountable. People don't take things serious enough. • Wrote her manager a letter on what was found for their gap analysis. By showing the work that needs to be done he has given her permission to get caught up with EMS as soon as possible.
EMS Team and	How do you run your EMS	• For our EMS team A is the Lead, B is Air and C is Hazardous Waste. Our site Process

meetings	project? Who in each department is going to be lead person in looking at and executing aspects and make sure things happen in your area.	Safety Specialist reports to St. Paul but works out of our building. He does a lot of work for this facility for this. The ESH Coordinator funnels up to the Environmental Lead to Management Representative to the Plant Manager. • The ESH Coordinator group meets with monthly. They report to their Business Unit Leaders. • Our EMS Organization Chart shows lines of who communicates to whom. The President empowers EMS, VP Legal and Safety. It also shows communication lines for the Environmental Manager, the Environmental Coordinator, VP of Plants, District Manager, Plant Manager, Foreman to Laborers. Every operating procedure we write shows the element of EMS and the line of communication. • Go to process areas, get Team Captains at a recruitment meeting. Ask who wants to be their team coordinator. We found people on the shop floor got most involved. Go carefully so people don't think they did the work in vain. Go through the list of what has been done and give them credit. • The Environmental Manager has to go to senior management and let them know so they can resource the EMS Coordinator's time. • Many people don't like to go to meetings if the big boss is there. Middle managers have requested the senior managers not to be there. After six months we decided they had to restart going to the meetings. • We put together a Safety and Environmental Team that includes the CEO, upper management, middle manager, R&D manager and anyone else they want to invite. The employees do not want to go to the team meeting with upper managers. • My employees are coming up with ideas, eg., recycling. We want to harness this creativity. • EMS management review offers a good summary, a snapshot, a track record. • You do not have to take negative people into this process. Take such a person aside and let them know their constant negative comments are not helpful. • If a CEO is the type of person who immediately takes action it can be intimidating. No one gets to sit the CEO down and tell him how it really is. • Our Project Manager has been working with people in their plant on aspects. She had them pretty ready to go but now there is a new manager for the district side so she needs to go back and review with the new manager.
Writing procedures	How long are your SOPs? How do you write them?	• Each unit sets the format on how they do their SOPs. It is important to have what works for them so they follow the SOP. The standard format is what to address and the department prepares the procedure in their format but addresses what we require. Most of our department's SOPs are 40-50 pages. • Looked at our existing SOPs to see if they provide operation control to manage the process. We found some areas where we need to modify.
Integrating into business processes	How do you identify for actual procedure improvement? I struggle with policy, procedure, work list and how they fit in with EMS?	• Look at PHA (Process Hazard Analysis) which is forward looking but if you look in the procedure people do not know why they are following this procedure. • The purpose of work instructions and a Management System is to integrate these into other Business Systems. Don't isolate or hand off responsibility. Take time to think about it, and use continuous improvement to get it to work better. • We are working with the VP of Operations to reeducate Purchasing to only purchase what they need. • An integral part of their EMS piece is looking at high efficiency motors.
Training	What do you train? How do you check for competence?	• We rely on people to check to make sure things are working in the process and if they don't this is a safety problem. Training is important. • Higher level training is a challenge. For example, Operators should know why a failure of the refrigerator system is a problem because of ozone depleting substances, and not just a call to Maintenance. • Train for complexity so employees can think within the new knowledge. Design training to address problem solving. • We have a coaching/mentoring program. • Have an initial pre test and post test. I • If you don't use it, you lose it. • Train people on where to find information for unique procedural activities. • Competence test: putting sticky notes on breakers then run a test that employees would have to pull the sticky notes off in the order they would reset the breakers. They would pile them in the order they pulled them off and the manager would have them bring the sticky notes back and he would check to see if they were in the proper order. • Find ways to publicize your reminders: in the paystub, by the phone, pocket guides, laminate tags that people can put with their badges • Communication. Let everyone know their position has a responsibility in the EMS and protecting the environment. • Plan this, not a haphazard approach. • Put a note out "Do you know we use this much paper per day…" type thing • Seminar to let senior management know that they are legally involved.

		•	We will have a poster with information located in each persons work area.
Stakeholders	Who is a stakeholder?	•	Anyone is a Stakeholder that has an interest in our businesses. How important you consider any group varies.
		•	A community action group can eliminate or reduce the mystique surrounding your facility. What they don't know hurts. You have to develop trust and be open and honest so they understand what is going on. It also gives a face to the company instead of a faceless entity. They also have a phone number and a person to call.
		•	We have an Open Houses and invite the public and regulators in and they could walk through the entire facility. Good food helps.
		•	If we were to expand, the first thing we would do is go to the community groups and let them know what is going on.
		•	We have very close ties to regulators, and are on a first name basis with all the community officials. We meet every month with the Town Manager on the water program. (Small town)
		•	We had OSHA here last November for training. They brought other VPP Star Site teams and also inspectors. When you have OSHA or EPA in for training it is always a win/win. We tell them if you see something point it out and we will correct it.
		•	If an incident occurs the EPA will do is go to the LEPC and any community group in your area and find out if you have a good relationship with them.
		•	Shareholders also value a history of involvement with stakeholders. Researchers for good corporate governance and socially responsible investing will look in the paper and if there is a discrepancy of what you say and what is reported about your actions, it is a huge negative.
		•	April 30th is the City Earth Day activities.
		•	Go out to community programs already going on. You will reach a lot more people that way. It is leverage off of high profile events.
		•	We are cleaning up a six mile portion of river that runs through the town.
		•	This is the season when people open their windows and noise and odor are problems.
		•	We have been trying to educate our customers on why they should not buy certain products and why they should purchase others.
Auditing		•	The audit is done in two parts, document review and then a review of operations. Talk to people and look at records.
		•	Some companies may have to do a preliminary audit.
		•	Our system will come together when we have our next audit. With this cycle closure, we will do another audit for certification
		•	It can be very intimidating and threatening but audits are a tool for getting good feedback.
		•	We have an "appreciative" audit. Ask what do you think we do right. Then ask what do you think we can do better. It is positive.
		•	We call ours a "Business Improvement Request."
		•	Our "Facility Self Assessment Process" is a one size fits all and does not deal with all issues for each site.
		•	We use various employees with varied jobs and train them. It is a report for the site by the site and it is not communicated out of the plant.
Justifying projects	How do you get support for EMS projects?	•	If customers want ISO, we are ready to go. Need customer's push.
		•	Enforcement actions is effective incentive.
		•	The VP of Operations is very supportive of the program. He sees the cost savings. (efficient motors, lighting)
		•	Our biggest job is educating people in the plant to look at alternatives for existing stuff because people have a tendency to replace with same.
		•	Purchasing Department says do whatever you have to do to keep the costs down. However, cost savings from EMS efficiency efforts applied to environmental practices would help. Get the CEO to explain to Purchasing that it is about balance and not just the bottom line.
		•	Marketing Department understands the customer concerns, but does not carry clout.
		•	Measure the value of some of the environmental projects, e.g., new recyclable packaging. Full stewardship approach to this material.
		•	Talk to your Media or PR or Market people to quantify the value of their leadership status. Try to quantify good will. Make a graph, make sure this is on the table.
		•	We have a pretty good capital process, consider strategic return on investment. A lot of environmental projects don't have a real payback with them so need say why some things were done over others.
		•	Give managers credit for long term planning. A good year puts you under more pressure to do better next year.
Emergency Response	Do you work with the LEPC? What is important in emergency and crisis response?	•	We had an incident where the Fire Department's ladders could not reach our silos. Need them involved in planning.
		•	We are it for a HAZMAT Team in this neighborhood. We also serve the region by sending one person, but only when the City requests because of liability issues.

		• We bring the Fire Department in and show them around to make sure they don't get hurt themselves. • Our own emergency response for the LP tank is intensive because the fire department does not understand how to handle LP fires. • Professional training for your staff gives good appreciation on how to handle a fire. Stow, Massachusetts, has a good training facility that utilizes concrete buildings for training. • Our plan for a fire is to evacuate. • Think through scenarios. Brainstorm with a mixed function team to get thorough planning and unique ideas • Conduct a critique after each emergency drill. • Notification is a formal system, and additionally we have thirty or so people with radios. We have a Fire Brigade and First Aiders that have pagers that will go off. • We have an Emergency Control Room we will activate who will manage the situation with responders, decisions about evacuation, etc. • We are as likely to shelter in place as to evacuate. Every area has their own shelter-in-place plan. • We have an ER show on safety, and are improving our safety areas. • Don't forget to tie ER to aspects. • You cannot rely on leaders because they may not be there. • Case studies show that the fall out or consequences can destroy your company. • We had to train people on how to operate the notification system and how to repair it, and do annual training on this.

The Environmental Lead will ensure that the internal auditors are trained to the extent necessary to ensure their competence in the skills required for planning and carrying out audit activities. For those with no auditing experience, successful completion of Solutia's internal EMS training course will be required at a minimum. To meet this requirement, EMS auditors can also attend outside EMS auditing courses, such as an accredited 5-day lead EMS auditor course, although this will not be required. Those with quality or safety management system auditing experience will only be required to receive a briefing from the Environmental Lead on concepts and requirements unique to an EMS. An EMS auditor must complete at least one internal EMS audit to the satisfaction of the Environmental Protection Lead before becoming a lead EMS auditor. After each internal EMS audit, the Environmental Protection Lead will assess each auditor's skills and audit results to determine whether additional training is required.

The Environmental Protection Lead will select the audit team and lead auditor. The audit team will be selected from among the qualified auditors. To ensure audit objectivity, the audit will be performed by those without direct responsibility for the activity being audited. All auditors will familiarize themselves with the EMS requirements and the areas being audited before performing the audit.

The lead auditor will develop an audit plan before starting the audit. Departments to be audited will be notified at least 14 calendar days in advance about the audit and the personnel conducting the audit. The audit criteria will ensure that Solutia's EMS was measured against the requirements of ISO 14001 and Solutia's own EMS requirements.

Before auditing a building or department, the auditor will first understand the significant aspects that occurred in that area by reviewing the aspects list. Then, the auditor will review the SOPs that apply to that area, so that he or she can ask more educated questions about a particular operation being performed. In addition, if there are any other EMS requirements that pertain to the area, such as monitoring data or records, these will also be reviewed. The auditor can then use this information to complete an audit form, which will help ensure that all the required questions are asked when performing the audit. A random, representative sample of plant employees and onsite contractors will be audited to ensure a thorough audit.

The audit will be conducted through a document and records review, interviews, and physical inspection using Solutia's EMS audit checklist. In particular, each auditor will look for evidence that any documentation meets the requirements of ISO 14001 and Solutia's own requirements, that the documentation was implemented where required within Solutia, and whether it was effective in meeting EMS requirements. The document and records review will typically be conducted prior to conducting interviews and physical inspections, with any necessary follow-up reviews conducted afterwards. Copies will be made of any documents or records found to contain errors or which were inconsistent with EMS requirements, and will be reported as part of the audit findings.

Interviews will be conducted in the work area, if appropriate, so that actual processes can be observed and any other records or related data reviewed. A physical inspection of the process or designated areas of the facility will be conducted at the same time. The observations and findings of the inspection will be documented.

After the audit, the audit team will reconvene to review audit results, including EMS non-conformances, and complete any of the plant's customized RecTrack corrective action forms required. Audit results will be graded as follows in order of severity:

- **OK:** Meets the requirements of ISO 14001 and Solutia's EMS requirements.
- **Observation:** Items that met the intent of the EMS, but with minor inconsistencies in documentation or implementation, will be noted as an Observation. Although noted in the documentation and reported back to the department, no action is required to be completed.
- **Minor:** A failure in some part of the documented EMS or a single observed lapse in conforming to one requirement of the EMS. A nonconformance that judgment and experience indicates was not likely to result in failure of the EMS, or materially reduce its ability to assure controlled processes and environmental impacts.

- **Major:** The absence or total breakdown of an element to meet an EMS requirement, or a number of minor nonconformities against one requirement. A nonconformance that judgment and experience indicate is likely to result in the failure of the EMS, or materially reduces its ability to assure controlled processes and environmental impacts.

The lead auditor will assemble the audit results, verify audit findings, and prepare a report and briefing for the Solutia Plant Manager, the Environmental Protection Lead, and others within 14 calendar days of completing the audit. The report will include a summary of the audit scope, the lead auditor and audit team members, dates of the audit, and audit findings with evidence supporting them, and recommended corrective actions. The review will be documented through meeting minutes. The Environmental Lead will keep the report and minutes for filing.

Major and minor non-conformances will be resolved using RecTrack. RecTracks will be prioritized in accordance with the importance of the issue as determined by the Environmental Protection Lead. The Environmental Protection Lead will brief Solutia's executive staff on the status of all RecTracks through the management review process. RecTracks will be completed using the plant's Nonconformity, Corrective Action, and Preventive Action procedure.

Based on these results, the Environmental Protection Lead will have the flexibility to initiate special audits as deemed appropriate. In the event that extraordinary EMS issues arise that require additional scrutiny, targeted audits may be scheduled.

APPENDIX III.
EMS Procedure for Management Review
(DRAFT)

The management review will be performed after all corrective actions identified during the EMS audit and the compliance audit have been effectively closed out. The management review will address the following:

- Results of EMS audits, compliance audits, and other audits and inspections.
- Communications from external parties, including complaints.
- Solutia's overall environmental performance.
- The extent to which objectives and targets have been met.
- The status of corrective and preventive actions.
- Follow-up actions from previous management reviews.
- Changes in operations or regulations and their environmental impacts.
- Recommendations for improvement.

The Plant Manager will address the possible need for changes to the Solutia environmental policy, objectives and targets, outstanding RecTrack forms, and the overall EMS based on the management review. These decisions will be documented in the meeting minutes.

The Environmental Lead will prepare an action plan to address any areas agreed upon for improvement. The action plan will include the course of action, responsible parties, and timeframes for completion. The RecTrack form will be used for initiating and managing any follow up actions.

References

1: Chicopee River Watershed Council web site (www.chicopeeriver.org)