ENVIRONMENTAL MANAGEMENT GUIDE FOR COLLEGES AND UNIVERSITIES

A PATH TOWARD SUSTAINABILITY

EPA

U.S. Environmental Protection Agency
New England

Office of Environmental Stewardship
October 2007
http://www.epa.gov/region01/assistance/univ/emsguide.html

"Creating a healthy and environmentally sustainable campus requires a systematic approach that integrates sustainability into every aspect of campus life, including addressing 'How, When, Where of campus growth', identifying compliance requirements, implementing sustainable practices, and realizing fiscal benefits. Using an environmental management system will allow schools to take a more holistic view of their campus and work together to grow in a more sustainable manner and improve their overall environmental performance."

Peggy Bagnoli
EPA College & University Sector Liaison
Office of Policy, Economics, and Innovation
U.S. Environmental Protection Agency

"An EMS offers a set of problem identification and problem-solving tools that can be implemented by anyone and everyone in a college or university in many different ways. These tools can help you complete projects and meet your goals. A fully implemented EMS integrates your goals into everyday operations, as environmental stewardship becomes part of the daily responsibility for everyone across the entire campus, not just in the environmental or planning department."

Gina Snyder
College & University Regional Sector Lead
U.S. Environmental Protection Agency
Region I New England

"..the Education and training required to be an effective advocate for a sustainable future is often learned on the job and through direct personal experience. Universities can play an important role in such education by providing students with a broader awareness, values clarification, technical and historical information, personal and professional skills, and an opportunity to share experiences."

Kenneth Geiser, "Education for a Transition to Sustainability" in *Inside and Out: Universities and Education for Sustainable Development*, edited by Robert Forrant and Linda Silka, University of Massachusetts Lowell

"EMSs are not extraordinary; they are the alternative to chaos."

Larry Falkin, Deputy Director, Parks and Recreation, Jackson County, Missouri

The U. S. Environmental Protection Agency funded this *Environmental Management Guide for Colleges and Universities* developed by the University of Massachusetts Lowell's EMS Service Program. While EPA made comments and suggestions on previous drafts, the views, suggestions, and tools in the Guide do not necessarily represent EPA positions, policies, endorsement.[1]

EPA Project Managers:

Gina Snyder, College and University Regional Sector Lead, snyder.gina@epa.gov
EPA Region 1 New England

Peggy Bagnoli, EPA College and University Sector Liaison
EPA Office of Policy, Economics and Innovation

UMass Lowell:

Madeline Snow, Director, EMS Service Program, madeline_snow@uml.edu
Frederic C. Murphy, Lead Trainer and Auditor
UMass Lowell EMS Service Program

This Guide draws heavily from the draft *College and University Environmental Management System Guide* published by EPA Region 1 New England in October of 2001, materials developed by the UMass Lowell EMS Service Program, information posted at http://www.campusems.org, and the following EMS guides:

An Environmental Management System Troubleshooters' Guide for Local Governments, Global Environment and Technology Foundation, October 2002. http://www.peercenter.net/sector/generalresources/more.cfm?frontid=2210

Environmental Management Systems: An Implementation Guide for Small and Medium-Sized Organizations, 2nd ed., NSF International, 2001. http://www.epa.gov/owm/iso14001/ems2001final.pdf

An Organizational Guide to Pollution Prevention, U.S. EPA, Office of Research and Development, EPA/625/R-01/003, August 2001. http://www.p2ric.org/CachedPages/printguid.pdf

Implementing the ISO 14001 Environmental Management System Specification, Version 2.0, James H. Schaarsmith. http://www.deq.virginia.gov/veep/pdf/isoguide.pdf

Integrated EMS Implementation Guide, U.S. EPA, Office of Pollution Prevention and Toxics, October 2000. http://www.epa.gov/dfe/pubs/iems/iems_guide/

Agency Sustainability Planning and Implementation Guide, Commonwealth of Massachusetts State Sustainability Program, 2004. http://www.mass.gov/envir/Sustainable/pdf/ss_guide_web.pdf

A special thank you and note of appreciation to Laurie Cecere, EMS Manager, and Molly McGovern, EMS Coordinator, of Cornell University for their insights, advice, and helpful comments.

[1] *The US EPA does not exercise editorial control over the information contained in non-EPA web sites, nor is the US EPA associated with or responsible for the content of these sites. The links to these web sites are provided for the convenience of the viewer.*

"As a public higher education institution, the University of Albany has both an obligation and an opportunity to be a leader in environmental sustainability. Our institution can and should set an example as an environmentally responsible citizen—a model for other colleges and universities as well as a model for our own students and the community in everyday life. At the same time, we must be rooted in reality, identify and understand the trade-offs that will be involved, and choose our options wisely."

Kermit L. Hall, President, University of Albany *(deceased)*

"Management systems are essential to the smooth and efficient use of available resources of any department. The field of health, safety, and environmental management is no exception. On a daily basis we must all be strong stewards of our institution, striking a balance between many demands including:

- *Compliance with federal and state rules and regulations*
- *Efficient use of all resources including financial and human*
- *Protecting and enhancing our campus environment through sustainable practices*
- *Meeting the missions of the University to educate, perform research, and provide outreach to the community "*

http://www.oseh.umich.edu/mgtcommitment.html
Terry Alexander, Executive Director
Occupational Safety & Environmental Health
University of Michigan

WHY SHOULD I USE THIS GUIDE?

Take these two surveys to see if your current efforts at compliance and sustainability could be helped by this Guide and the Management System tools it includes.

SURVEY 1: COULD A MANAGEMENT SYSTEM HELP OUR COLLEGE OR UNIVERSITY?

COMPLIANCE

Do you know what **legal environmental requirements** apply to your operations?

(a) Yes and there is a system to keep us up to date on them
(b) No, but I know who does
(c) No

Are your operations in **compliance?**

(a) Yes
(b) More than 50% are
(c) Less than 50% are

When do you usually become **aware** of the status of your institution's compliance?

a) On a regular basis
b) When we get inspected
c) When we get a penalty or fine

WATER

Do you know your annual **water** use and costs as well as potential ways to reduce them?

(a) Yes
(b) No, but I know who does
(c) No

ENERGY

Do you know your annual **energy** use and costs as well as potential ways to reduce them?

(a) Yes
(b) No, but I know who does
(c) No

WASTE

Do you know how much **solid** and **hazardous waste** is generated and potential ways to reduce volume, toxicity and associated disposal costs?

(a) Yes
(b) No, but I know who does
(c) No

PUBLIC IMAGE

What do you think the **general public** thinks of your institution's commitment to the environment and sustainability?

(a) Very responsible & committed
(b) Neutral
(c) Irresponsible and not committed

Do you know if your institution has taken steps to reduce its **use of toxics** or implement other **pollution prevention** projects?

(a) Yes
(b) No, but I know who does
(c) No

SUSTAINABILITY

Do you have sustainability projects or initiatives?

(a) Yes, they are documented and integrated into operations
(b) Yes, but if their project 'champions' leave, the efforts may not continue or expand
(c) No

REACTIVE VS. PROACTIVE

How often do you feel you are reacting to crises rather than being proactive?

(a) Never
(b) Sometimes
(c) All the time

NOW ADD UP YOUR SCORE AND CHECK THE RESULTS BELOW.

of (a) answers_____ x 3 = _____

of (b) answers_____ x 2 = _____

of (c) answers_____ x 1 = _____

Total Score: _____

QUESTIONNAIRE RESULTS:

Score of 19-30: You have systems and procedures in place that enable you to be in compliance, identify opportunities to reduce or avoid costs, and promote sustainability. This Guide may provide new ideas to keep your programs on track.

Score of 10-18: You have some systems and procedures in place but improvements could be made. This Guide will help you improve your programs and achieve your goals.

A score of <10: A Management System is needed! This Guide will provide the road map to the system you need.

SURVEY 2: HOW SUSTAINABLE IS OUR SUSTAINABILITY INITIATIVE?

1) Count up the environmental/sustainability projects or initiatives (e.g., recycling, energy conservation, waste reduction, P2, green chemistry) you have going on at your campus.

   For each one, give yourself 3 points.

2) Do you have identified people or positions that are responsible for the projects or initiatives?

   If yes, add 2 points.

   If no, take away 2 points.

3) Are there specific goals set for these projects/initiatives? (e.g., reduce waste generation by X % by Y date)

   If yes, add 2 points.

   If no, take away 2 points.

4) Are there measures (e.g., normalized, meaningful) and established baseline conditions?

   If yes, add 2 points.

   If no, take away 2 points.

5) Are there written procedures and systems in place that document how these projects/initiatives actually operate?

   If yes, add 2 points.

   If no, take away 2 points.

6) Are these projects/initiatives evaluated on a regular basis?

   If yes, add 2 points.

   If no, take away 2 points.

7) Does your administration (e.g., Provost, Deans, Chancellor, President) get briefed on progress, challenges, needs?

   If yes, add 2 points.

   If no, take away 2 points.

8) If you or the 'champion' of these projects/initiatives hit the lottery tomorrow and resigned, would they continue?

   If yes, add 2 points.

   If no, take away 2 points.

   If don't know, take away 1 point.

Assessment: If you found yourself starting with a lot of points because your campus has a lot of environmental or sustainability projects but then found you subtracted points because of a lack of identified responsibilities, goals, measures, and procedures, you don't have a system in place to keep the Sustainability Initiative going.

Individual projects and initiatives are great but they are most effective when they are connected with operations, have documented procedures, use measures and are checked to see how they are working.

Use this Guide to help make the connections, achieve goals, measure/report your success.

Read On!

TABLE OF CONTENTS

Approaches, tips, traps, tools and examples are included in each section. Look for these symbols to highlight specific guidance:

Keys to success

Practical tips

Traps to avoid

Advice or examples from other colleges and universities

Commonly asked questions

How-to steps or approaches

Tools you can use

INTRODUCTION TO MANAGEMENT SYSTEMS AND SUSTAINABILITY

INTRODUCTION

COLLEGES, UNIVERSITIES, THE ENVIRONMENT AND SUSTAINABILITY

Colleges and Universities are analogous to small cities encompassing within their campus borders a myriad of diverse operations and activities that can impact the environment. These can include research laboratories, conference centers and lodging, art studios, cafeterias, student housing, power plants, sports facilities, fleet maintenance, incineration, wastewater treatment, construction and demolition, grounds maintenance, drinking water supply, and agricultural research as well as the management of hazardous materials, ozone-depleting substances, asbestos, and hazardous, solid, infectious and radiological waste. Many of these are regulated and have increasingly high operational costs. Yet they also present great opportunities for pollution prevention and the conservation of natural resources.

Reasons cited by colleges and universities as drivers to improve compliance, environmental performance and sustainability

- Reputation
- Better management
- Enforcement actions
- Cost reduction and avoidance
- Community relations
- Support of educational excellence

Whether motivated by enforcement actions, a desire to improve 'town-gown' relations or reputation, their values and commitment to a sustainable future, and/or the need to reduce or avoid costs, colleges and universities are spending more resources than ever before to comply with their environmental, health and safety obligations as well as explore their opportunities to improve environmental performance and sustainability.

These improvements are often addressed on a project-by-project basis or in reaction to a crisis such as an enforcement action. Often done in isolation from one another, the improvements are usually not measured, evaluated or put in the context of continual improvement. The results are short-lived practices that vary widely across the campus. Without written procedures and documentation, even the most successful of projects or initiatives may not be fully integrated into the day-to-day actions of teaching, research, residential life, facilities management, and procurement operations, particularly if the 'champion' leaves or moves onto other projects.

Many institutions find that projects or initiatives are not enough and that they need to develop systems to prevent or manage their environmental issues. Systems improve compliance and environmental performance, enhance education, reduce or avoid costs, and move the institution towards sustainability.

PURPOSE

This Guide offers tools and approaches to meet a college or university's goals for compliance, environmental performance, and sustainability in a proactive and effective manner. It has been designed to increase:

- Awareness of environmental health and safety issues, regulatory requirements, and opportunities for improvement
- Compliance with environmental requirements
- Overall environmental performance
- Awareness of sustainability and opportunities to promote sustainability
- Effectiveness of projects or short-term efforts
- Use of management systems, approaches and procedures so that compliance, improved performance, and sustainability become a part of day-to-day operations

If your College or University wants to: (check boxes)

- ☐ Improve and achieve consistent compliance
- ☐ Avoid fines and expensive corrective actions due to compliance violations
- ☐ Lower day-to-day impacts on the environment
- ☐ Reduce environmental management and operating costs
- ☐ Improve working and living conditions for students, faculty, and employees
- ☐ Enhance the educational experience of its students
- ☐ Improve relations with government agencies
- ☐ Enhance image and reputation
- ☐ Maintain positive community relations
- ☐ Quantify and document environmental performance and sustainability practices
- ☐ Integrate environmental and sustainability practices in all aspects of campus life

Then this Guide can help.

AUDIENCE

This Guide is intended to assist: managers and staff with environmental responsibilities, Safety, Health and Environment (SHE) departments, senior administrators, business managers, facilities managers, compliance managers, purchasing/procurement managers, planners, directors of offices of sustainability, teams, faculty, and students. It is intended to enhance the work of several associations representing and supporting colleges and universities in their efforts to improve safety, health and the environment, compliance and sustainability.[2]

[2] These include: American Council on Education, http://www.acenet.edu; Association for the Advancement of Sustainability in Higher Education, http://www.aashe.org; Association of Higher Education Facilities Officers, http://www.appa.org; Campus Consortium for Environmental Excellence, http://www.c2e2.org; Campus Safety Health & Environmental Managers Association, http://www.cshema.org; National Association of College & University Business Officers, http://www.nacubo.org; Society for College and University Planning, http://www.scup.org. See also EPA's *Best Management Catalog* at http://www.epa.gov/ne/assistance/univ/bmpcatalog.html.

APPLICABILITY

Historically, most organizations, including colleges and universities, approached their environmental responsibilities along the following path[3], each step improving upon the last and often with the goal of sustainable operations but sometimes stopping short of sustainability.

Where on this path do you think your college or university is?

We recognize that each college or university has its unique needs and challenges and may vary greatly in their commitment to compliance, environmental performance and sustainability. This Guide is designed to assist institutions wherever they might be on the path toward improvement.

Our goal is a guide that helps colleges and universities design and implement systems, (including compliance and environmental performance), promote pollution prevention and sustainability and save money. Note that it is not a stand-alone document or a boiler-plate template. The procedures should be tailored to meet the specific needs and uniqueness of your institution.

Designing and implementing systems to improve compliance, environmental performance and sustainability can be challenging. It takes a fair amount of resources — people, money, time, energy and attention. However, based on previous experiences, many institutions discover that they have 85% of the pieces already in place. All that is needed is a system to tie it all together.

The following sections introduce management systems and help you decide which portions and tools will best support your college or university.

[3] Excerpt from a presentation made by Kristel Riddervold, Environmental Manager, City of Charlottesville, Virginia, to PEER Centers, 12/1/05.

INTRODUCTION TO MANAGEMENT SYSTEMS

The systematic approach provided by a management system framework has served to improve performance for many campuses across the country. A 'management system' approach may not spring to mind considering the free flow of ideas and decentralized operations of a college or university, but an environmental management system is actually a great tool that colleges and universities have found helpful in leading them to high performance.

An Environmental Management System (EMS) provides a framework for understanding an organization's "environmental footprint," complying with environmental regulations, and implementing proactive pollution prevention and sustainability strategies. An EMS is not a checklist completed once a year to review compliance or a one-time project. Similar to curriculum development or teaching a class, an EMS invokes a continual cycle of planning (planning the class), doing (teaching the class), reviewing (testing and grading the class), and improving (giving feedback and making changes as needed).

This cycle can keep a college or university on the path towards high performance behavior and conserving resources with an eye toward the future. A college or university that invests in an EMS can realize an array of benefits that justify EMS "curriculum development costs".

"At Boston University, our management system successfully integrates environmental programs with health and safety. The foundation of our system is an "EHS Policy Manual" with 24 short, plain-English policies that serve as a practical guide to the entire community."

Peter Schneider, Director,
Office of EH&S, Boston University

"An EMS can serve as a blueprint for colleges and universities to plan, direct and facilitate their environmental programs. The EMS should provide an encompassing view of the necessary considerations in the college's management of environmental affairs."

Alan Cantara, EH&S Manager,
Rhode Island School of Design

"Many institutions separate environmental sustainability initiatives from legal compliance and environmental, health, and safety services. At MIT, we take a comprehensive and integrated approach to all aspects of acting on our environmental commitment."

Jamie Lewis Keith
Managing Director for Environmental Programs and Risk Management, and Senior Counsel, MIT

"An EMS has provided a means of empowering all students, staff and faculty to participate in UMass Lowell's environmental program and commitment to sustainability."

Rich Lemoine, EH&S Manager,
University of Massachusetts Lowell

Why develop an EMS?

Organizations with EMSs report:

- Improved compliance
- Prevention, reduction, and management of environmental impacts
- Improved interdepartmental relations
- Cost savings
- Reduced risk, leading to reduced insurance premiums
- Progress moving towards sustainability
- Improved relationships with regulators
- Increased employee awareness, involvement, responsibility and morale
- Improved labor-management relations
- Improved public image

See also "The 2006 Benchmark Survey of the State of EMSs at Colleges and Universities' at http://www.c2e2.org/2006_EMS_Report.pdf

An EMS is a tool to get you to Sustainability.

It may be helpful to think of an EMS as a set of problem identification tools that can be implemented in many different ways, depending on an institution's activities and needs. A successful EMS:

- Integrates environmental consideration into everyday business operations
- Helps organizations address their regulatory demands in a proactive, systematic and cost-effective manner
- Includes environmental stewardship in the daily responsibility for employees, faculty, students, vendors, and administrative staff[4].
- Involves everyone and makes them responsible for the institution's compliance and sustainability efforts, not just the safety, health and environmental (SHE) professionals or Sustainability Offices.
- Serves as a framework and disciplined approach to achieve sustainability.

What is an Environmental Management System?

An EMS is a system of processes that helps an organization:

- *Identify its environmental priorities*
- *Establish plans to reach its environmental goals*
- *Make environmental understanding and responsibility part of everyone's daily business*

Put another way, it's a way to figure out:

- *Who has what impact on the environment*
- *How to prevent or minimize that impact*
- *How to stay out of trouble, save money, and feel and look good over a long period of time*

What is Sustainability?

"Sustainability means using, developing and protecting resources at a rate and in a manner that enables people to meet their current needs and also provides that future generations can meet their own needs. Sustainability requires simultaneously meeting environment, economic and community needs."

http://oregonfuture.oregonstate.edu/part1/pf1_02.html

"Sustainability is the ability to achieve continuing economic prosperity while protecting the natural systems of the planet and providing a high quality of life for its people. Achieving sustainable solutions calls for stewardship, with everyone taking responsibility for solving the problems of today and tomorrow—individuals, communities, businesses and governments are all stewards of the environment."

http://www.epa.gov/sustainability/

[4] *An Environmental Management System Troubleshooter's Guide for Local Governments.* Global Environment and Technology Foundation, p. 4. http://www.peercenter.net/sector/generalresources/more.cfm?frontid=2210

An EMS is not just about compliance

It is a systematic way to address issues like energy conservation, environmentally preferred purchasing, toxics reduction, stewardship and sustainability.

BASIC STEPS OF AN EMS/SUSTAINABILITY ROADMAP

ARTICULATE the vision (compliance, environment, sustainability)

IDENTIFY and gather data on how operations affect the environment

UNDERSTAND what legal and other requirements apply

PRIORITIZE what to work on

ESTABLISH your measures

SET GOALS to be met

MANAGE your most significant issues

DOCUMENT what you are doing

TRACK progress

CHECK if your system is working

LEARN from your efforts

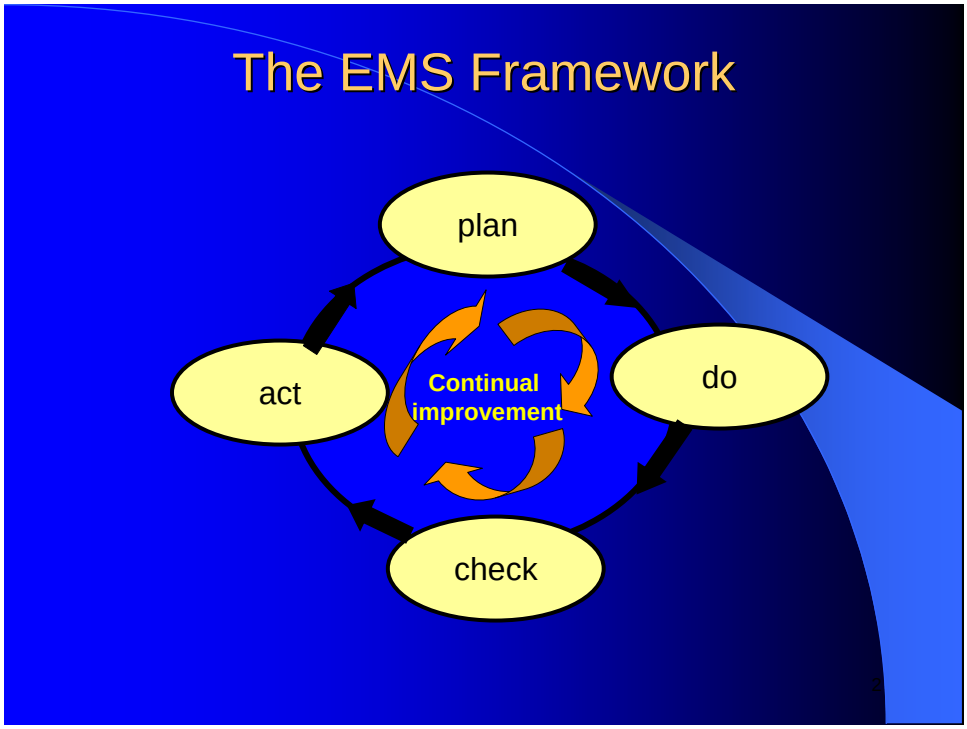
IMPROVE

"EMS methods work really well to embed sustainability. At UML we are using a mission and policy, teams and dialogue, planning and task assignments, and finally transparent measures of progress."

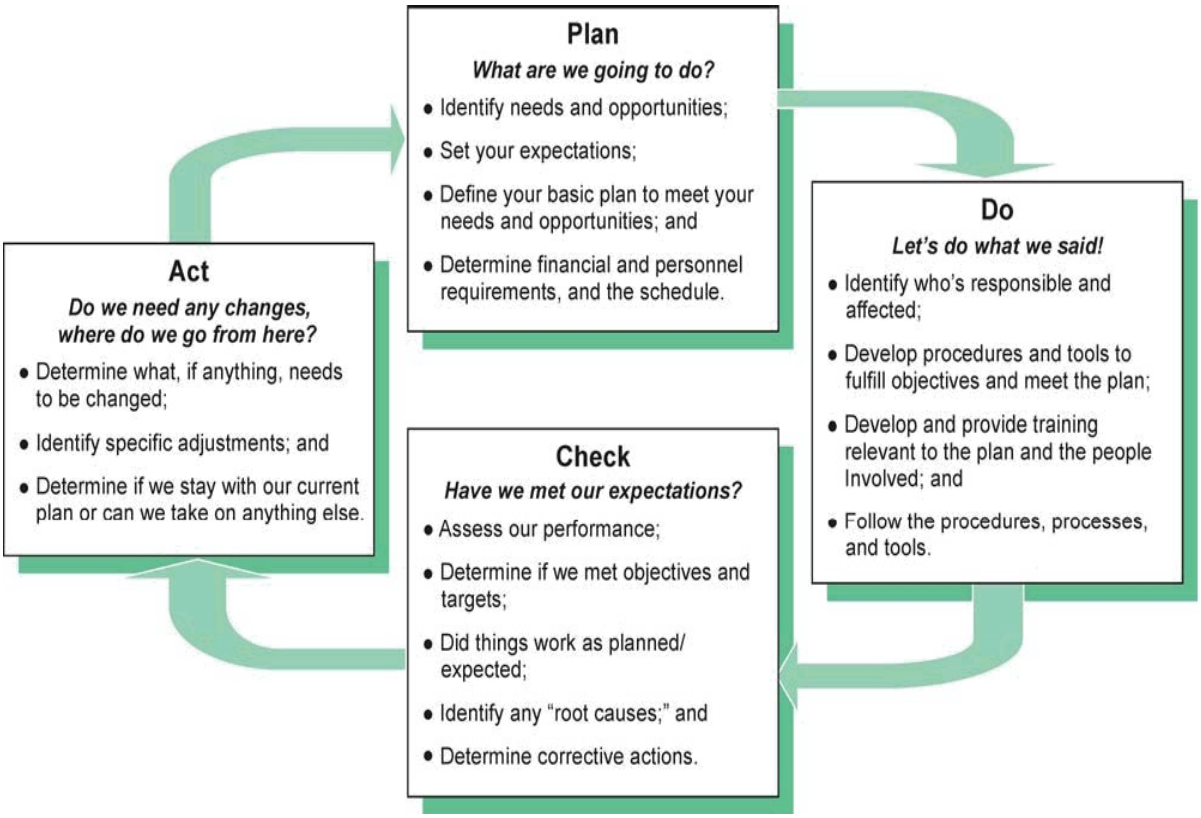
Janet Clark, Toxic Use Reduction Institute
University of Massachusetts Lowell

The EMS process follows a "Plan-Do-Check-Act" model that can be presented in many different ways. Some visual presentations resonate more with some people than with others. Two are provided below but you can find other versions in other EMS guides as well. See which one works best for you.

EXAMPLE 1:



EXAMPLE 2:



EMS AND ISO 14001

It should be noted that adherence to or certification to the ISO standard is not required. Many organizations, including colleges and universities, have made internally driven decisions to follow the standard exactly and seek certification. However, many choose to not seek certification.

This Guide presents elements that are generally derived from, and align with, the International Standard for Environmental Management Systems, ISO 14001 (see schematic below). However, it does not strictly adhere to it but rather focuses on how the EMS process, tools and techniques can be applied to improve compliance, environmental performance and sustainability initiatives even if your college or university is developing less than a 'full' EMS or is developing an EMS without seeking ISO certification.

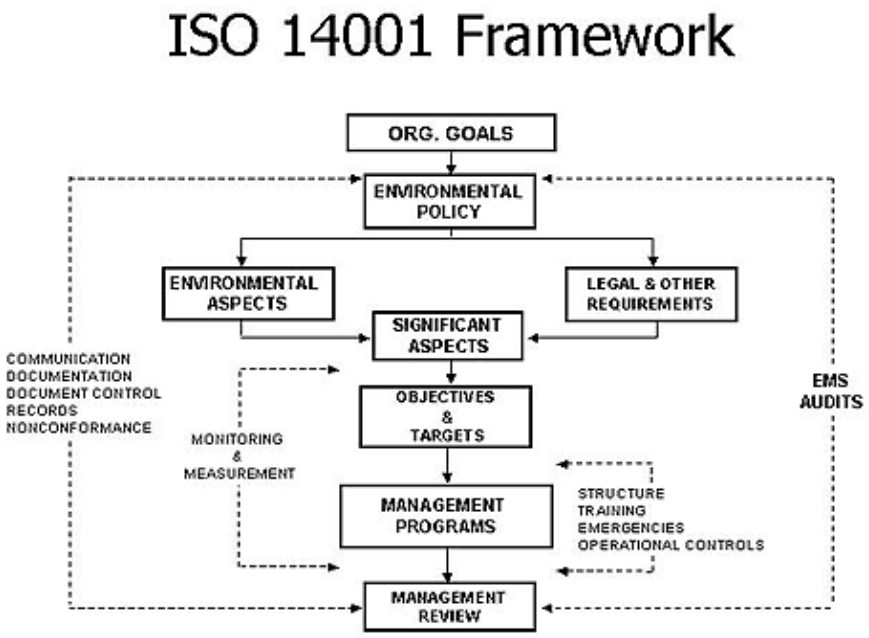
If your college or university is pursuing ISO certification, it is recommended that you also consult other ISO EMS Guides in addition to this Guide.

What is ISO?

ISO is the International Organization for Standardization, located in Geneva, Switzerland. ISO is a non-governmental organization, established in 1947, and is a global network that mainly functions to develop voluntary technical standards that aim at making the development, manufacture and supply of goods and services more globally compatible.

ISO 14000 refers to a family of voluntary standards and guidance documents to help organizations address environmental issues. Included in the family are standards for EMS, environmental and EMS auditing, environmental labeling, performance evaluation and life-cycle assessment.

In September 1996, the International Organization of Standardization published the first edition of ISO 14001, the specific standard for Environmental Management Systems. This international voluntary standard is a specification of what is required for an EMS to receive certification or registration under ISO (and can be used to guide development of an EMS whether or not certification is anticipated). A second edition of ISO 14001 was published in 2004, updating the standard. http://www.iso.org/iso/en/iso9000-14000/understand/inbrief.html



What is EPA's position on EMSs?

EPA encourages regulated organizations to develop EMSs.

"From the perspective of a regulated facility, an EMS is based on common sense and intuitive business decisions. Facilities need to learn from the tools available, then start by taking small, doable steps and build momentum from there. To do the job right, they'll need proactive involvement from senior management, front-line workers, and supervisors throughout the company. They'll need to keep the big picture in mind, but define reasonable expectations. Facilities implementing an EMS should set goals and time frames in line with their expectations, then monitor progress, make corrections where necessary, and capitalize on any elements of an EMS that they may already have in place." http://www.epa.gov/sectors/ems.html

The following is a 'crosswalk' between the sections of this Guide, 'plain English', and the 17 elements in ISO 14001

Section	'Plain English' Way to Say It	ISO Element that most corresponds
I. Getting Started		ISO 14001:2004(E)
Environmental / Sustainability Policy	What do we value and commit to (at the highest levels)?	4.2 Environmental Policy
II. Plan		
Identifying Aspects and Impact	What activities affect the environment?	4.3.1 Environmental Aspects and Impacts
Legal and Other Requirements	What regulations apply to our operations?	4.3.2 Legal and Other Requirements
Compliance	Are we in compliance?	4.5.2 Evaluation of Compliance
Significant Aspects	How do we decide what to work on?	4.3.1 Environmental Aspects and Impacts
Objectives and Targets	What do we want to accomplish and by when?	4.3.3 Objectives and Targets and Environmental Management Programs
III. Do!		
Environmental Management Programs	How are we going to meet our goals?	4.3.3 Objectives and Targets and Environmental Management Programs
Managing Significant Aspects to Reach Your Goals		
Operational Controls	What parts of our operations do we need to focus on to meet our goals?	4.4.6 Operational Control
Roles and Responsibilities	Who's going to do this?	4.4.1 Resources, Roles, Responsibility and Authority
Communications	How do we get awareness and involvement?	4.4.3 Communication
Training	How do we make it real: who needs to be trained and on what?	4.4.2 Training, Awareness, Competence
Document Control & Records Management	Are we working with the right tools?	4.4.5, 4.5.4 EMS Documentation, Document Control, Records

Emergency Response and Preparedness	How do we respond to and prepare for potential emergencies?	4.4.7 Emergency Preparedness and Response
IV Check and Act		
Measurement and Monitoring Performance	How well is the system working? Are we tracking our efforts? Are we making progress towards our goals?	4.5.1 Monitoring and Measuring 4.5.2 Evaluation of Compliance
Corrective and Preventive Actions	How do we find and fix problems so they don't happen again?	4.5.3 Nonconformance and Corrective Action and Preventive Action
Audits	Are we doing what we said we would?	4.5.5 EMS Audits
Administration Review	How do we reflect back and learn from our experiences? (taking it back to the top) What do we need from leadership to make things happen?	4.6 Management Review
V. Keeping up Momentum	How do we keep it going and expand our efforts?	

HOW TO USE THIS GUIDE

The following sections of this Guide are:

I. Getting Started

II. Plan

III. Do

IV. Check and Act

V. Keeping up the Momentum

For each specific sub-topic, except in the "Getting Started" section, the following questions are posed and answered:

- What is it?
- What purpose does it have?
- What's in it?
- What does it make possible?
- Why do we need it?
- When should we develop it?
- Why do we need a procedure?

If you want to develop a management system, follow all the sections. Use each section of this Guide as appropriate to develop an EMS framework that works for you.

If you want to incorporate management systems tools into projects or sustainability initiatives, proceed through each section to determine which tools would work best for your campus. You can always assess whether or not to proceed further after each step.

Recognizing that institutions vary greatly in their current compliance as well as interest in environmental excellence and/or sustainability, we suggest first looking at the following page to assess which of the Guide's sections, tools, and processes might be the most appropriate and useful to you.

If this sounds familiar:	Then focus on:	See these sections:	Use these tools:
"What regulations?"	Awareness and Compliance	Compliance Communication	**Compliance review,** P. II-30, **Calendar,** p. II-35 **List of legal &other requirements,** pp. II-22-28 **Compliance checklists,** p. II-32 **Training matrix worksheet,** p. III-64 **Responsibility matrix,** p. III-42
"Don't look for trouble; they'll never get around to inspecting us." **"We teach; you figure out the regulations."** **"We're in compliance for now; let's hope it stays that way."**	Improving awareness of regulatory requirements Identifying roles and responsibilities Systems to document and maintain Compliance Developing procedures to meet regulatory requirements Develop procedure for compliance audits	Legal & Other Requirements Training Communication Roles and Responsibilities Non-conformance and corrective action*	
"We have some great projects to improve environmental performance but they don't necessarily: • **connect to each other** • **get managed as well as they could be** • **measure for results** • **have procedures or systems to ensure they continue."**	Systems to improve and connect projects Setting measurable goals and measures of success Developing project management tools Documenting operational controls	Objectives & Targets Environmental Management Programs Measuring & Monitoring Communication Records	**Project Management Tool,** p. I-12 **Aspects & Impacts,** p. II-2 **Flowcharting,** p. II-10 **Determination of significance,** p. II-43 **Forecasting or 'backcasting' methods to set specific goals,** pp. III 59-62 **Campus Metrics,** p.IV-5 **Action Plans/EMPs,** p. III-13
"We have a Sustainability Initiative but we struggle with priorities, ways to measure success, and how to integrate sustainability into operations."	Systems to improve and integrate Sustainability Setting priorities Setting measurable goals and measures of success Developing project management tools Documenting SOPs	Aspects & Impacts Ranking / Priorities Operational Controls	
"We want or have to develop an Environmental Management System." **or** **"We want to pursue ISO 14001 certification."**	EMS EMS elements and process	All sections, with particular attention to notes regarding ISO.	**All tools.**
"We have a functioning EMS but want to expand it to include Sustainability."	**EMS plus Sustainability 'Backcasting' Aspects and Impacts to incorporate sustainability goals**	**Aspects & Impacts** **Communication** **Audits & Management Review**	**Stakeholder analysis,** p. I-14 **'Backcasting',** p. II-62 **Audits,** p. IV-25

Let's get started.

PHASE I: GETTING STARTED

The steps, tips, and tools in this Section are management tools that are helpful whether you are developing an environmental improvement project (e.g., recycling or environmentally preferred purchasing), an Environmental Management System, or a Sustainability Initiative. This work is best done by a Team that crosses organizational and functional boundaries.

Take the time in this Phase to lay the foundation for the effort to change the way your institution operates. But don't get so mired in getting ready that you never actually get started!

This Phase includes:

- Top management support and buy-in
- Identifying a Project or 'Fenceline'
- Initial planning: expectations and scope
- Identifying a Project Lead or EMS Manager
- Selecting a Team
- What the Team should do first
- Communication and roll-out strategy

Keys to Success

Administration commitment and support

Active and meaningful engagement of academic, operational, administrative staff and students

Ability to build on existing processes

Effective teams

Balancing the need for 'quick hits' with longer term changes

Communication of meaningful results

TOP MANAGEMENT SUPPORT AND BUY-IN

How committed is top management? As with any change at a college or university, the support of presidents, chancellors, deans and senior administrative and operational staff is critical. There is a never-ending list of issues, initiatives, and funding requests that your Administration has to deal with. Carving out the time, resources, and commitment for environmental improvements, an EMS or Sustainability Initiative is challenging but necessary.

Tip

Practice with a peer explaining your project, EMS or Sustainability Initiative in different ways. Ask your peer to play different roles (e.g., President, Academic Dean, Chair of Chemistry Department, Business Manager, Facilities Manager) as you explain what you are trying to accomplish and what it might mean for them (e.g., increased visibility, reduced costs, recognition).

WHAT WILL THEIR ROLE BE?

Top management's key activities are typically to[5]:

Display leadership/commitment:
Provide Connections between departments and functions.

Approve plans and programs:
Provide input and approve environmental/sustainability policy.

Provide resources:
Appoint Project Manager or EMS Management Representative.

Track performance:
Provide input and approve goals, objectives, targets.

Ensure continual improvement:
Review system to ensure adequacy and suitability.

Trap to avoid

Thinking, "They're all on board—I don't need to keep in touch with them." Even with all best intentions, if people don't hear from you on a regular basis, they may forget about your efforts, think that nothing is happening, and/or assume you don't need their support.

IDENTIFYING A PROJECT OR 'FENCELINE'

You can't do everything at once. So how large should your environmental improvement project be? What operations, buildings, facilities or faculties should your EMS or Sustainability Initiative cover? These decisions will affect success, results, and continuing interest and motivation. Choose well!

Colleges and universities vary in how they define 'fencelines'. Examples include:

- Faculty of Arts and Sciences, covering all FAS activities in 2 buildings that also include other Faculties.
- Building that houses graduate school chemistry teaching and research labs
- Vehicle maintenance operations
- Campus-wide EMS or Sustainability Initiative
- Waste generation, management, recycling and disposal across a campus
- Purchasing
- Design and construction of new buildings

[5] *An Environmental Management System Troubleshooter' Guide for Local Governments.* Global Environment and Technology Foundation, p. 18. http://www.peercenter.net/sector/generalresources/more.cfm?frontid=2210

Before defining a project scope or 'fenceline', think about[6]:

- *Which parts of our operations have the most environmental 'hot spots'?*
- *Which parts of our operations give us concern, especially regarding regulatory compliance?*
- *Where do we use the most natural resources (energy, water)?*
- *Where do we use the most hazardous materials? Generate the most waste?*
- *What faculty and administrators (and where) are most interested in environmental improvements, compliance and sustainability?*
- *Where could we get some quick improvements and create success stories to share?*
- *If considering an EMS: Should it cover both environment and health and safety issues? How pertinent is the ISO 14001 EMS model to our institution? Do we need to tackle the whole institution at once or build momentum with selected departments and activities before expanding?*

Remember, your scope or 'fenceline' should be limited enough so that you don't get so overwhelmed that the people working on this become paralyzed but not so narrow that the work could be simply accomplished by one or two people without the need for a team, procedures, and training.

Tip

Use the **Project Summary/Project Management Tool** (page I-11). This is a good tool for project management, communication, as well as team building. Some have found it helpful in assessing whether your 'fenceline' is too narrow or too broad.

Traps to avoid

Getting stuck in developing the perfect scope: it needs to be good enough so it is clear what you are doing, what you hope to accomplish, and generally what you need. But it doesn't have to be perfect—it's a tool that helps you get started and moving. Another trap is to develop a scope but never look at it again to see if you need to make adjustments. The cycle of Plan-Do-CHECK-Act should be applied here as well.

[6] *Ibid. p.20.*

INITIAL PLANNING, EXPECTATIONS AND SCOPE

Whether your college or university is trying to increase awareness, compliance, environmental performance and/or sustainability, it is important to take the time to understand and articulate expectations, scope and needs.

1. **Think about what you are trying to accomplish.** Discuss:
   - *Why do we want to improve our environmental performance? Sustainability?*
   - *What benefits do we expect to achieve?*
   - *What will we measure to know if we've been successful?*
   - *Where is the best place to begin our efforts (project scope or 'fenceline')?*
   - *Who will lead the effort?*
   - *Who should be involved?*
   - *What challenges do we expect to face?*
   - *What resources will we commit?*

2. **Find out what resources might exist to help.** There are probably others in your community who might be able to assist you in your efforts. These might include other colleges or universities, private companies or government agencies that have developed EMSs or Sustainability Initiatives. Ask them: How long did it take? What did you learn from your experiences? What were the benefits and unexpected obstacles? If you had it all to do again, what would you do the same? What would you do differently?

   On-line links are also useful. These include: http://www.c2e2.org, http://www.aashe.org, http://www.campusems.org, http://www.peercenter.net, http://www.epa.gov/sectors/colleges, http://www.epa.gov/region1/assistance/univ/index.html.

3. **Write a concise plan.** It is strongly suggested that you take the time to write a concise plan, scope or outline (see attached format, page I-12) to articulate what you are trying to accomplish, by when, and what it will take to get you there. There may be some resistance to taking the time to do this rather than just jumping in and starting something new. Make the investment upfront; you will not regret it.

4. **Develop an initial timeline.** How long will it take? It all depends on what you are trying to accomplish, how expansive your efforts are, what competing priorities might exist, and the interest and capacity of your college or university to make operational and cultural changes across departments, functions, and

Tip

A college or university's schedule is different from all other organizations. Plan around the academic year's intense periods so that your timeline is reasonable for you, the Team, and the institution.

campus populations.

Experiences from other colleges and universities vary but there is a general belief that initial planning can take 6-9 months and developing and fully implementing an EMS or Sustainability Initiative can take an additional 12-18 calendar months. Remember that the academic year calendar has whole months that are taken up by other activities (e.g., August/September have orientation, beginning of classes; December and January have final exams, holidays; May and June have final exams, graduation, and student move-outs).

IDENTIFYING A PROJECT LEAD OR EMS MANAGER (ENVIRONMENTAL MANAGEMENT REPRESENTATIVE)

You have all been members of a team at some point in time. You may also have been the leader of a project or team. Leading environmental projects, an EMS, or a Sustainability Initiative is essentially the same. It requires:

- Knowledge of operations
- Good project management, organizational, and communication skills
- Commitment and enthusiasm
- The ability to listen to others with different perspectives and ideas

Teams are not easy to manage or lead. Learn how to be a better project manager by acquiring and/or honing good project management skills.[7]

Tip

Think of the teams you have been on that were successful. They were probably led by someone who was goal-oriented, respectful towards others and respected at different levels in the organization. He or she was probably able to keep the team focused on their goals while not precisely dictating what the Team developed.

[7] Ask yourself:
- *How can I be an active listener (i.e., give full attention to others without interrupting)?*
- *How can I bring people together who have different ideas, perspectives and responsibilities to work constructively together?*
- *How can I design and run meetings that are effective, engaging, and valued by others?*
- *How can I communicate with my peers, staff, and supervisors?*
- *How can I be sure to delegate out tasks to others?*
- *How well do I track progress and check back to see if adjustments are needed?*

Who's Who?

Colleges and universities have to establish roles and responsibilities for the persons charged with developing and implementing your EMS, team project or Sustainability Initiative. Assigning roles and responsibilities during the planning process ensures that: (1) everyone understands their roles; (2) everyone knows what influence they will have and how it will affect their work load; and (3) not all tasks will fall on one person or department.

Roles typically used in developing and implementing an EMS, environmental project, or Sustainability Initiative:

- **Manager:** Employee appointed by, and with the support of the administration, is responsible for initiating and leading implementation. This person may direct the department responsible for environmental and/or sustainability matters (or may report to the individual charged with such responsibility).
- **Team:** Depending on the scope, a Core group of people may be comprised of staff (e.g., facilities, maintenance), faculty, students, department heads, and administrators responsible for day-to-day activities. Consider representation from students, purchasing, legal department and alumni affairs. While safety, health, and environmental professionals may lead the initiatives, broad representation is critical for success.
- **Steering Group:** Small group of participants and administrators providing (1) direction with respect to the breadth and direction of the effort; (2) feedback via administration review to the Team to ensure progress, effectiveness, and wise use of resources; and (3) resources (directly or indirectly by approving the allocation of time spent on the effort).

SELECTING A TEAM

Who's going to do this? Projects, management systems, and sustainability initiatives run cross departments, functions, and operations across a campus. One or two people in an Office of Sustainability or Environmental Health and Safety working by themselves cannot bring about the changes needed to make environmental concerns and sustainability a part of everyone's day-to-day operations on campus. You need a cross-functional Team to truly change your college or university's practices.

A Core Team plans, delegates tasks, establishes deadlines, collects and evaluates work products such as SOPs, and provides training, guidance and feedback. They are the 'champions' and drivers of the EMS, project or Sustainability Initiative.

Who should be on the team?[8] Some people will be excited to participate in your environmental project, EMS, or Sustainability Initiative. Others will be busy with other tasks and be unable or unwilling to devote attention to these efforts. Others will be outright ambivalent and a few will be hostile and stand in the way of implementation.

You probably already have some idea who should be on the Team. There are leaders in your institution who have succeeded previously to promote policy changes. It may not necessarily be a supervisor; it could be an influential

[8] *The UMass-Lowell EMS Service Program*, Workbook 1, 2001. p. 3.

union representative, professor or worker who holds no formal position of authority on environmental or sustainability issues but influences a large number of people. As you plan the recruitment of your team, think about the people who have delivered in the past, those who haven't and, in particular, those that could impede or stop your efforts to change operations.

Traps to avoid

Picking team members who all think alike, come from one department, and/or "get along with everyone". You need a team with different ideas and perspectives who will not be afraid to voice their differences or concerns. Quiet and peaceful teams are not necessarily effective teams. Better to have the potential saboteurs on your team and be part of the process. They can become your greatest advocates.

Expecting teams to think like you and do what you want them to on your schedule. Teams need time to become effective; different perspectives on a team may not align with yours. Be open but keep the team moving forward and together.

You can ask for volunteers but it is also strongly suggested that you assess what group or individuals should be included in the Team. Think about those internal 'stakeholders' who have interest in your efforts. Then think about those who will have an 'impact' on the work (i.e., those who can make or break the effort). Think about how to engage both so that the Team will have success and influence. A 'stakeholder interest and impact' worksheet (page I-14) is a useful tool to begin to identify key individuals or departments that should be on the Team. (It is also a useful tool in designing communication strategies throughout the life of projects, initiatives or EMSs).

Tip

Don't forget unions! The work of their members has an impact on you institution's compliance, performance and sustainability. Involve them early.

The size of the Team will vary depending upon on several factors, including the size of the project scope or 'fenceline, the operations involved, existing reporting structures, and personal interests of those in the operations being affected. Generally, a team of 5-8 is manageable and effective.

How do we create a functioning team? Learn about team-building[9] and how to lead an effective team. Understand that teams take time to develop into fully functioning teams and that they go through a "forming-storming-norming-performing" evolution[10].

[9] See a useful guide, *Team Time?*, King County, WA at http://www.peercenter.net/sector/solidwaste/emstoolbox.cfm

[10] The 'forming-storming-norming-performing' model of team development was first proposed by Bruce Tuckman in 1965 who maintained that these phases are all necessary and inevitable - in order for the team to grow, to face up to challenges, to tackle problems, to find solutions, to plan work, and to deliver results. This model has become the basis for subsequent models of team dynamics and frequently used management theory to describe the behavior of existing teams (http://en.wikipedia.org/wiki/Forming-storming-norming-performing cited October 16, 2007).

Tips

- Feed your teams! It may sound silly but providing food (coffee, bagels, muffins, pizza, fruit or cookies) goes a long way in getting people to meetings on time and getting them to look forward to meetings.
- Make a schedule of team meetings and what each meeting is supposed to accomplish.
- Similarly, make a schedule of when and where in the process Team members are going to be acknowledged and recognized for their efforts. Teams need and deserve recognition throughout the life of their work, not just in the beginning. Recognition could include emails or letters from the Dean, a photo of the team and write up on the intranet or in an e-newsletter, highlighting the work of the Team at another event or meeting, etc. Schedule these kinds of recognition 'events' regularly!

Pointers for team-building:

1. Share expectations.
2. Understand critical success factors and barriers.
3. Have a clear decision-making process.
4. Develop a team charter with mission, vision.

-Laurie Cecere, EMS Manager, Cornell University

Procedure for Working with a Team (Unofficial)

- Call everyone together and sit down
- Have coffee and donuts
- Brainstorm
- Listen, listen, listen
- Record
- Then move forward.

- Rich Lemoine, UMass Lowell

WHAT THE TEAM SHOULD DO FIRST

To help a Team become the fully functioning team your college or university needs it to be, you can use many methods (your own as well as potential exercises, page I-10) to focus on:

1. Learning more about:
   a. Each other
   b. Their respective operations

c. Existing programs, activities, policies, and procedures related to compliance, environmental performance and sustainability

d. Management systems

2. Evaluate or assess your institution's:

   a. Current sustainability practices, using such tools as:

      i. Campus *Sustainability Profiles* http://www.aashe.org/resources/profiles/profiles.php

      ii. *The Pacific Sustainability Index* http://www.roberts.cmc.edu/PSI/scoringsheet.asp

      iii. *Exploring Pathways to a Sustainable Enterprise: SD Planner* http://www.gemi.org/sd

      iv. *EPA's Smart Growth at Colleges and Universities* http://www.epa.gov/smartgrowth/univ_resources.htm

   b. Current management system to identify what elements of a management system might be in place as well as the gaps between current practices and a management system (see Gap Analysis, page I-18, and C2E2 EMS Scorecard, page I-24).

3. Refine your timeline

4. Develop a communication strategy and rollout

COMMUNICATION STRATEGY AND ROLLOUT

How will we communicate with senior management? Use existing communication mechanisms but make sure to schedule regular and concise communications. Many have experienced success using short updates at regularly scheduled meetings and then more structured updates at specially scheduled briefings. Remember: communicate what is working, the outcomes or results of the project, EMS, or Sustainability Initiative, and what you need to move forward. Don't be afraid to ask for help in resolving issues.

Who should we communicate with? Use the 'stakeholder analysis' (page I-14) to identify stakeholders and develop communication strategies.

See a sample stakeholder analysis and communication plan from Cornell University at http://www.c2e2.org/ems/stakeholderanalysis.doc

How will we communicate with others on campus? Think about the last campus-wide communication you can remember: What made it memorable? How many different ways did your receive it? What made it connect with you? Use these experiences to communicate early, often, and in lots of different ways. Just as your college or university uses a lot of techniques to increase its profile and its ability to recruit the best students, your Team needs to use different techniques to raise the visibility and perceived value of its work.

Tip

Begin to collect, record, and communicate benefits from your project, EMS, or Sustainability Initiative **ASAP**! Dollars saved, costs avoided, waste reduced, fewer spills and accidents, are all examples of benefits that resonate well with senior management. Information on other colleges and universities is also useful. This information can range from enforcement woes to recognition awards.

Potential Activities for newly formed teams:

To learn more about:	Try this activity
Each other	Each person is asked to talk about[11]: • Their responsibilities • How long they have worked at the institution • What has changed since they started working there • What has stayed the same
Their operations	Team members are asked to identify the connections between their operations in terms of environmental compliance, performance, and sustainability.
Existing programs, activities, policies, and procedures	Team members are asked to identify the ones they use the most. At the meeting, the Team discusses their relevancy, whether they are applicable and relevant.
General: Management Systems, Sustainability	Before a meeting, team members perform web searches on compliance, EMSs, and Sustainability efforts in colleges and universities. (Team members should be encouraged to search creatively for information. The following are suggested: http://www.epa.gov/ems, http://www.epa.gov/sustainability, http://www.peercenter.net, http://www.campusems.org.) Team members come to the next meeting and discuss what they learned from different perspectives.
EMS	EMS or Sustainability training (Many institutions may be willing to share their presentations.) The Household EMS group exercise (page I-16), a quick way to help a group connects the concepts in management systems to everyday experiences. Discuss the following 'take aways' • Plan-Do-Check-Act cycle in a management system • 3 pillars of an EMS (compliance, pollution prevention, continual improvement) • Essence of an EMS: "Say what you do, Do what you say, and Prove it!"

[11] Developed by the UMass Lowell EMS Service Program.

	• The value of checking back and making adjustments on a regular basis ("Audits are our friends")
To learn more about:	**Try this activity**
How these efforts could be beneficial on personal, professional institutional levels	What's in it for me? (**WII.FM**) exercise[12]: Groups of two are asked to identify: • What's in it for me if this project, Sustainability Initiative, or EMS is successful? • What's in it for our college or university? • What's in it for the environment? • What's in it for the community? **Perception of our Institution** exercise[13] to help team members see a larger context. *Exercise:* The team is asked the following questions: (1) "What do you think the 'outside world' (e.g., community, regulators, alums, parents) thinks of how our college or university thinks about or acts on environmental and sustainability issues?" (2) What do you want them to think?" and (3) "What do you never, ever want them to think?" A list of common themes is then developed through the report back. This exercise helps Team members articulate both their aspirations and concerns. The responses can then be grouped together in themes that can be used to drive the development of an environmental/sustainability policy and other activities.

[12] Adapted by the UMass Lowell EMS Service Program from an exercise developed by the University of New England.

[13] Developed by the UMass Lowell EMS Service Program.

Sample Project Summary/Project Management Tool[14]

Project Name: **Date:**

Project Manager:

Project 'Sponsor'[15]:

Why project is needed or wanted: (i.e., why are we doing this, what difference will it make?)

[E.g., We are improving compliance because_____. We are developing an EMS because_____. We are developing/improving a Sustainability Initiative because_____.]

Vision: (i.e., how will things be different as a result of the project?)

[E.g., With improved compliance, we will be able to_____. With an EMS we will be able to_____. With a Sustainability Initiative, we will be able to_____.]

Scope: (i.e., what will and will not be done in the project)

[E.g., define a 'fenceline' (operations, academic departments, or buildings) you will focus on.]

Goals: (i.e., major outcomes of the project, how the project will support our mission)

[14] Adapted by Madeline Snow, UMass Lowell EMS Service Program, from Action for Results, Inc. © 1999-2000.

[15] Many projects identify a Project 'Sponsor' who is providing overall guidance, authority, and resources to the team. In a college or university setting, these are typically the Director of Environmental Health and Safety, Sustainability Coordinator, Vice President or Provost.

Stakeholders: (i.e., who needs/should be involved? who has impact?)[16]

Deliverables: (i.e., visible, concrete outputs of the project)

Related Projects: (i.e., other projects that may have an effect on or be affected by this project; note what will or might not be done as a result of the project)

Major milestones: (i.e., key completion dates of major elements, timeline)

What you need to make project successful: (i.e., budget, hours from others, indirect assistance, etc.)

Strategies: (i.e., the major activities that will occur to complete the project)

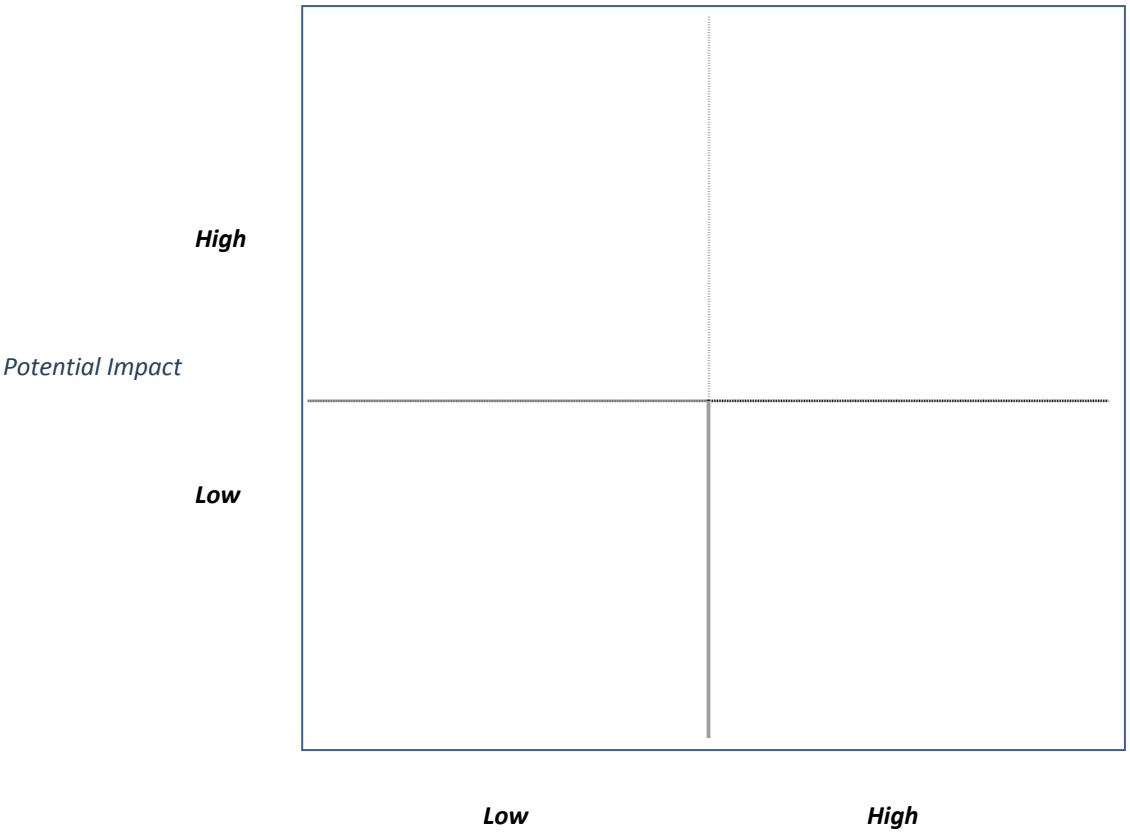
Assumptions: (i.e., relevant things that are known or believed to be true)

Measures of success: (i.e., initial thinking about how we will know project has been successful; think SMART--Specific, Measurable, Achievable, Realistic, and Timely)

[E.g., Fill in the blanks: This will be a success to me if_____. This will be a success to my supervisor if_____. This will be a success to my institution if _____. This will be a success to the environment, health and safety of the campus and community if _____.]

[16] See the Stakeholder Interest worksheet on the following page for a tool to help in this effort.

Stakeholder Interest and Impact "2 x2 Worksheet"[17]



INSTRUCTIONS:

This exercise can be anywhere in the process but it is especially useful early in the process in finalizing the 'fenceline' and the Core Team. It can also be used to develop (and adjust) communications strategies at any time during in a project, Sustainability Initiative, or EMS.

Large flip charts are used and initial key staff from the organization use small 'post-it' notes to write down stakeholders (either groups or individuals) and then place them on the grid (an example is provided on the following page).

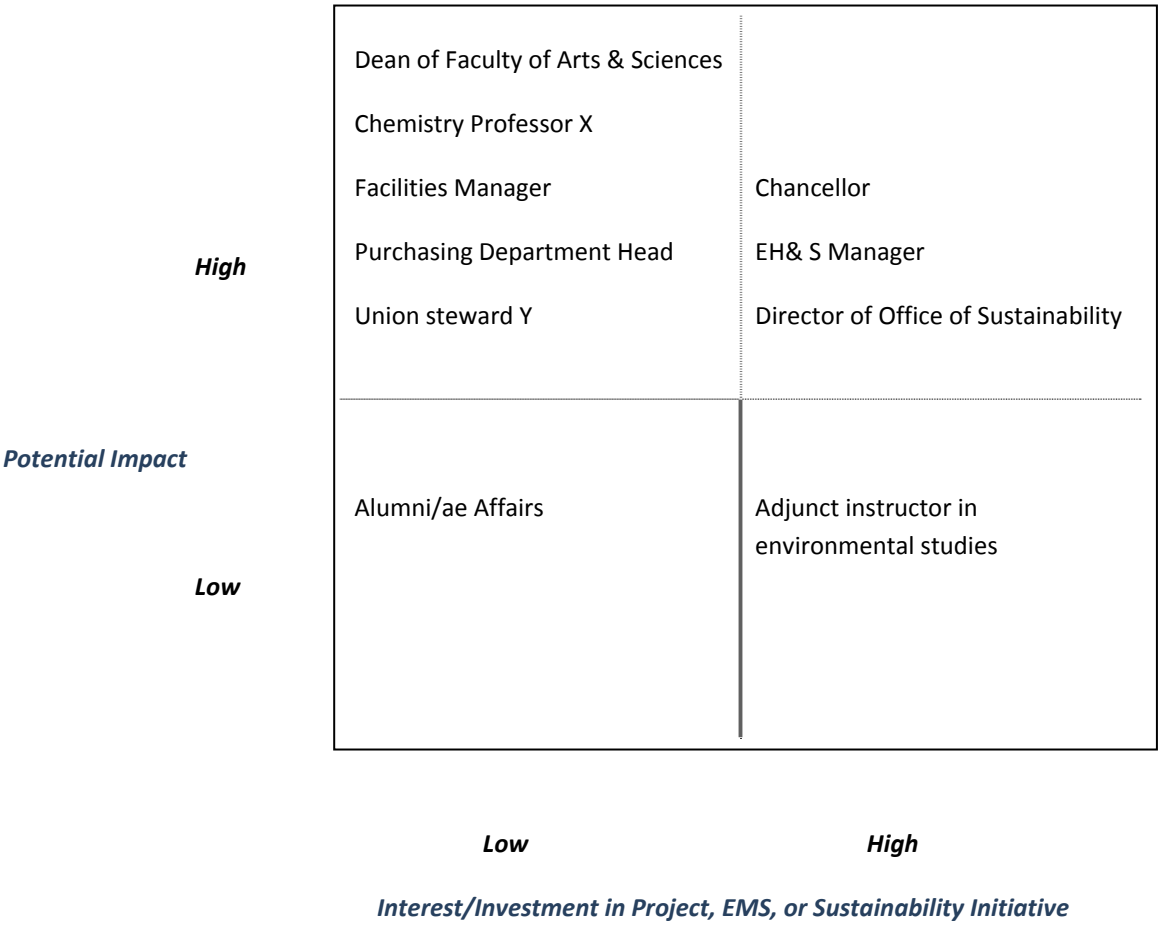
This is useful in (1) rethinking the fenceline; (2) identifying individuals or units who should be asked to be on the Core Team; (3) identifying what communication strategies and timing are needed for certain individuals or units.

It is also useful at 6-9 months intervals to (1) reassess the interest and potential impacts of various stakeholders; (2) evaluate and adjust communication strategies; and (3) plan new communication strategies.

---

[17] Adapted by Madeline Snow, UMass Lowell EMS Service Program, from Action for Results, Inc. © 1999-2000.

EXAMPLE



In the above scenario, the Chancellor, EH&S Manager, and Sustainability Director have great interest/investment in the effort. They also have a high potential impact on the success of the effort.

The Dean, Purchasing Department Head, Facilities Manager, and Chemistry professor are not that interested or invested in the effort. However, their potential impact to make or break the effort is very high. Their involvement and the strategies to communicate with them might be very different than if they were all on board.

YOUR HOUSEHOLD EMS[18]

Design an EMS for your household, development, condominium, apartment complex or office building.

1. What are the activities of your household that impact the environment?

_____

_____

_____

_____

_____

_____

2. Can you rank this by level of importance?

_____

_____

_____

3. What would be your criteria for determining that something was more significant than another?

_____

_____

_____

4. What activities do you currently undertake to benefit the environment?

_____

_____

_____

_____

[18] Developed by Matthew Donahue, UMass Lowell EMS Service Program, *UMass Lowell EMS Workbook 1.*

5. Set an objective for your most significant aspects that you have identified above

_____

_____

_____

6. Set a target date to meet your objective

_____

_____

7. What ways would you attempt to improve your environmental impacts?

(Make list and describe a specific plan to improve.)

_____

_____

_____

_____

_____

8. How would you measure your success?

_____

_____

_____

9. Draft procedures for your household members and tell how they would be communicated to everyone.

_____

_____

_____

_____

_____

GAP ANALYSIS

Adapted from An Environmental Management System Troubleshooter's Guide for Local Governments, Global Environment and Technology Foundation, http://www.peercenter.net/sector/generalresources/more.cfm?frontid=2210

Environmental/Sustainability Policy	
1. Does your campus or group have an environmental or sustainability policy? Do you have other kinds of policies that might be used as models?	Yes ☐ No ☐ Partial ☐
Notes:	
2. Does your policy include commitments to continual improvements, prevention of pollution and compliance with relevant laws and other requirements to which the institution subscribes?	Yes ☐ No ☐ Partial ☐
Notes:	
3. Is the policy communicated to all employees and students and made available to the public? How are important campus initiatives communicated, can you use the existing process?	Yes ☐ No ☐ Partial ☐
Notes:	
Environmental Aspects	
4. Do you have a way that you identify the significant environmental aspects of your operations? How does your campus prioritize projects, are there tools already in use that you can modify?	Yes ☐ No ☐ Partial ☐
Notes:	
Legal and Other Requirements	
5. Does your institution have a way that you identify and provide access to applicable laws and regulations, and other requirements to which the organization is subject?	Yes ☐ No ☐ Partial ☐
Notes:	

6. Is there a procedure/mechanism for you to secure the latest revisions of those requirements identified above?	Yes ☐ No ☐ Partial ☐
Notes:	
Objectives and Targets	
7. Have documented environmental objectives and targets been established that: • identify responsibilities, schedules and the means by which the objectives and targets will be met • take into account the significant environmental aspects, laws, regulations, legal and other requirements	Yes ☐ No ☐ Partial ☐ Yes ☐ No ☐ Partial ☐
Notes:	
8. Do you have a procedure for identifying the views of interested parties (e.g., alumni, community, accreditation agencies)?	Yes ☐ No ☐ Partial ☐
Notes:	
Roles and Responsibilities	
9. Have defined roles, responsibilities and authorities, including the appointment of a specific manager in charge of the environmental project, EMS, or Sustainability Initiative been established?	Yes ☐ No ☐ Partial ☐
Notes:	
10. Have sufficient financial, technical and human resources been made available to implement the project, EMS, or Sustainability Initiative?	Yes ☐ No ☐ Partial ☐
Notes:	
Operational Controls	
11. Have you developed, implemented, and/or documented operational controls for activities associated with significant environmental aspects? (e.g., SOPs for boilers and heating plants, wastewater treatment, chemical hygiene plan for laboratories or an environmental management plan for laboratory wastes)? Can these existing plans or documents be used to develop a process to control other important environmental impacts on the campus or for your project?	Yes ☐ No ☐ Partial ☐

Notes:	
12. Does the maintenance plan ensure that operational controls remain in operation?	Yes ☐ No ☐ Partial ☐
Notes:	
13. Are operating criteria (e.g. temperature, pressure, flow) clearly established and documented for operational controls?	Yes ☐ No ☐ Partial ☐
Notes:	
Training	
14. Have all environmental training needs been identified? If not, is there a process in place (e.g., for health and safety) that you can use to develop yours?	Yes ☐ No ☐ Partial ☐
Notes:	
15. Are all employees/faculty/students whose work involves significant environmental and safety aspects competent by training, experience and/or education?	Yes ☐ No ☐ Partial ☐
Notes:	
16. Are all employees, faculty, students, and contractors aware of the requirement of the project, EMS, or Sustainability Initiative, their roles in it, and potential consequences of departure from operating procedures?	Yes ☐ No ☐ Partial ☐
Notes:	
17. Has the organization identified training needs for providing general awareness to all employees, students, faculty and managers/department heads and deans?	Yes ☐ No ☐ Partial ☐
Notes:	

Communication	
18. Have internal communications procedures regarding environmental or sustainability issues been established and implemented? If not, are there other cross-department or intra-departmental programs that can provide a model to work with?	Yes ☐ No ☐ Partial ☐
Notes:	
19. Do you have established procedures for communicating relevant requirements to suppliers and contractors?	Yes ☐ No ☐ Partial ☐
Notes:	
20. Have you considered procedures for external communication of your significant environmental aspects?	Yes ☐ No ☐ Partial ☐
Notes:	
21. Do you have procedures for communicating relevant requirements to suppliers and contractors about significant environmental aspects, goods and services?	Yes ☐ No ☐ Partial ☐
Notes:	
22. Have suppliers and contractors been informed of any applicable project, EMS, or Sustainability Initiative requirements?	Yes ☐ No ☐ Partial ☐
Notes:	
Emergency Preparedness and Response	
23. Do you have established emergency identification, preparedness and response procedures?	Yes ☐ No ☐ Partial ☐
Notes:	
24. Are there review and revisions of the emergency preparedness and response procedures, particularly after an incident?	Yes ☐ No ☐ Partial ☐

Notes:	
25. Are there periodical tests of the above procedures?	Yes ☐ No ☐ Partial ☐
Notes:	
Monitoring and Measuring	
26. Are operations associated with significant environmental aspects, operational controls and performance toward objectives and targets being monitored and measured (e.g., scorecards, record reviews, performance observations, trend analyses, etc.)?	Yes ☐ No ☐ Partial ☐
Notes:	
27. Have procedures for evaluating compliance (e.g., compliance audits, reviews, or inspections) with the law been established and are they being implemented?	Yes ☐ No ☐ Partial ☐
Notes:	
Audits	
28. Is there a procedure for EMS or Sustainability audits and is it being implemented? If not, are there other auditing programs in place that you can learn from or build on?	Yes ☐ No ☐ Partial ☐
Notes:	
29. Is the information from the various monitoring, measuring and auditing programs being recorded and reported to senior management?	Yes ☐ No ☐ Partial ☐
Notes:	
Nonconformance and Corrective/Preventative Action	
30. Are there procedures in place that are being implemented for handing EMS non-conformances (including legal noncompliance)? If not, does your campus have programs (e.g., for accreditation reviews) that have procedures to respond to nonconformance that you can model?	Yes ☐ No ☐ Partial ☐

Notes:	
Management Review	
31. Are the top levels of your institution involved in environmental matters? Is your senior management, on a regular basis, reviewing the structure and performance of the EMS to determine the appropriateness and effectiveness of the EMS and identify potential opportunities for improvement?	Yes ☐ No ☐ Partial ☐
Notes:	
32. Is senior management provided sufficient information for this review, including the results of performance measurements and audits? If you are not currently doing this, is there a program that you can model your reviews on?	Yes ☐ No ☐ Partial ☐
Notes:	
Documentation Control and Records Management	
33. Are the core elements of the EMS documented, including all of the required procedures? If not, what programs on campus have a document system that you can model or use?	Yes ☐ No ☐ Partial ☐
Notes:	
34. If you are implementing a full EMS, are there sufficient records to demonstrate that each element of the EMS, including all of the procedures, are documented and are being implemented?	Yes ☐ No ☐ Partial ☐
Notes:	
35. Is there a procedure being implemented for managing documents and records to ensure that all paperwork is current, accurate and readily retrievable? If not, what programs/areas of campus can you review to see what processes might be adapted to your needs?	Yes ☐ No ☐ Partial ☐
Notes:	

C2E2 EMS SCORECARD

The Campus Consortium for Environmental Excellence (C2E2) is a not-for-profit organization whose members are leading colleges and universities. Its mission is "to support the continued improvement of environmental performance in higher education through environmental professional networking, information exchange, the development of professional resources and tools, and the advancement of innovative regulatory models. Environmental performance includes campus regulatory compliance, environmental management, and sustainability initiatives". To help institutions move their EMSs forward, the C2E2 developed an EMS self-assessment tool designed to help a campus identify the strengths and weaknesses of its current EMS. http://www.c2e2.org/ems_assessment/emsassess.htm

USING THE CROSSWALK

The C2E2 Scorecard is essentially an EMS gap analysis and as such consists of a series of questions to identify the extent to which your EMS conforms to the generally agreed upon elements of a complete EMS.

To the right of the "Score" column, you will find a reference to where in this Guide, or which element, addresses the question. Consequently, the "crosswalk" links each C2E2 question to an appropriate part of the Guide, making it easy to find help in areas where you most need assistance.

A Word of Caution:
The "crosswalk" is based on C2E2 tool that contains terminology and concepts central to EMSs. If they are unfamiliar to your EMS Team, begin with some EMS awareness training that could include a review of the resources listed in this Introduction.

C2E2 Scoring

Score	Criteria
0	No process or program in place
1	A process (such as an undocumented procedure) exists but because it is unwritten or limited in scope, it is not fully adequate or effective.
2	The process generally works well or a procedure has been articulated, but is not comprehensive or integrated.
3	An appropriately comprehensive and integrated procedure exists.

Enter your score in the space provided, and make note of any comments or observations such as what information you used to answer the question, any actions to be taken to improve the situation or a score, or challenges in developing a procedure.

This scorecard contains a total of 33 questions in five different sections. It is important to acknowledge that the scores are designed to be useful as tools not grades per se. Because there are an unequal number of questions in each “section," the total score may be skewed by a strength or weakness in a particular section. In order to evaluate scores across the sections, some users may wish to "normalize" scores by assuming each section is worth 20 percent of the total and developing a normalizing factor for each section.

A "perfect score" of "99" (for example, every question received a score of 3) would, if responded to thoroughly and honestly, indicate that the organization has all of the requisite EMS elements and procedures for an effective "state of the art" EMS. More likely, you will find that scores vary substantially across and within sections.

C2E2 EMS SCORECARD – EMS GUIDE CROSSWALK

(Based on C2E2 EMS Self-Assessment Checklist)

College/University Department or Organization: _____

Review Conducted By: _____

Date Performed: _____

EMS ELEMENT	SCORE	Section in Guide
1.0 POLICY		
1.1 Is the environmental policy defined and endorsed by top management?		Phase I: Getting Started: Environmental/Sustainability Policy
1.2 Does the environmental policy address environmental impacts relevant to an institution of higher education?		
1.3 Does the environmental policy include commitments to the improvement of its environmental performance?		
1.4 Does the environmental policy include a commitment to comply with relevant environmental laws and regulations, and other requirements or obligations to which the institution has agreed?		
1.5 Does the environmental policy provide a framework for setting and reviewing environmental objectives and targets?		
1.6 Is the environmental policy implemented, maintained and communicated to faculty, staff and students?		
1.7 Is the environmental policy publicly available?		
Subtotal (total maximum points = 21)		

2.0 PLANNING		
2.1 Is there a procedure to identify significant environmental impacts?		Phase II: Identifying Environ-mental Aspects and Impacts
2.2 Are significant impacts considered in setting environmental objectives?		

2.3 Is there a procedure to identify, access, and update environmental legal requirements?		Phase II: Legal and Other Require-ments; Objectives & Targets
2.4 Are environmental objectives and targets systematically established, reviewed, and documented?		
Subtotal (total maximum points = 12)		

3.0 IMPLEMENTATION AND OPERATIONS		
3.1 Are roles, responsibilities, and authorities defined, documented, and communicated?		Phase III: Roles and – Respsonsi-bilities.
3.2 Does management provide the resources essential to the implementation and control of the EMS?		
3.3 Have all training needs been identified?		Phase III: Training
3.4 Are faculty, staff, and students competent to fulfill their roles under the EMS?		
3.5 Are appropriate procedures established for internal communications to faculty, staff, and students?		Phase III: Communicatio n
3.6 Are appropriate procedures established for external communications regarding the EMS?		
3.7 Is there documentation describing the EMS?		Phase III: Controlling Documents and Managing Records
3.8 Are proper document control procedures established?		
3.9 Are all documents in a proper state and format?		
3.10 Are operations and activities associated with significant environmental impacts effectively managed?		Phase III: Emergency Preparedness and Response
3.11 Are procedures established and implemented for operations and activities identified as having the potential to cause significant harm to human health and the environment?		
3.12 Are procedures established to identify potential accidents and emergency situations?		
3.13 Are procedures established to respond to accidents and emergency situations?		
3.14 Are such procedures periodically tested and reviewed/revised after tests or after actual incidents?		

Subtotal (total maximum points = 42)		
4.0 CHECKING AND CORRECTIVE ACTION		
4.1 Is information systematically collected that is pertinent to the evaluation of programmatic and functional aspects of the EMS?		Phase IV: Measuring and Monitoring Performance
4.2 Are records appropriately retained?		
4.3 Are processes in place where support the collection of information to determine compliance with applicable environmental laws and regulations?		
4.4 Is collected information analyzed to identify deficiencies and areas of concern?		
4.5 Are corrective actions developed to prevent future issues, in addition to correcting the immediate problem?		Phase IV: Audits, Nonconformance, corrective action, preventive action
4.6 Are recommended and/or required corrective actions verified for implementation and evaluated for effectiveness?		
4.7 Is the checking and corrective action program evaluated for effectiveness?		
Subtotal (total maximum points = 21)		

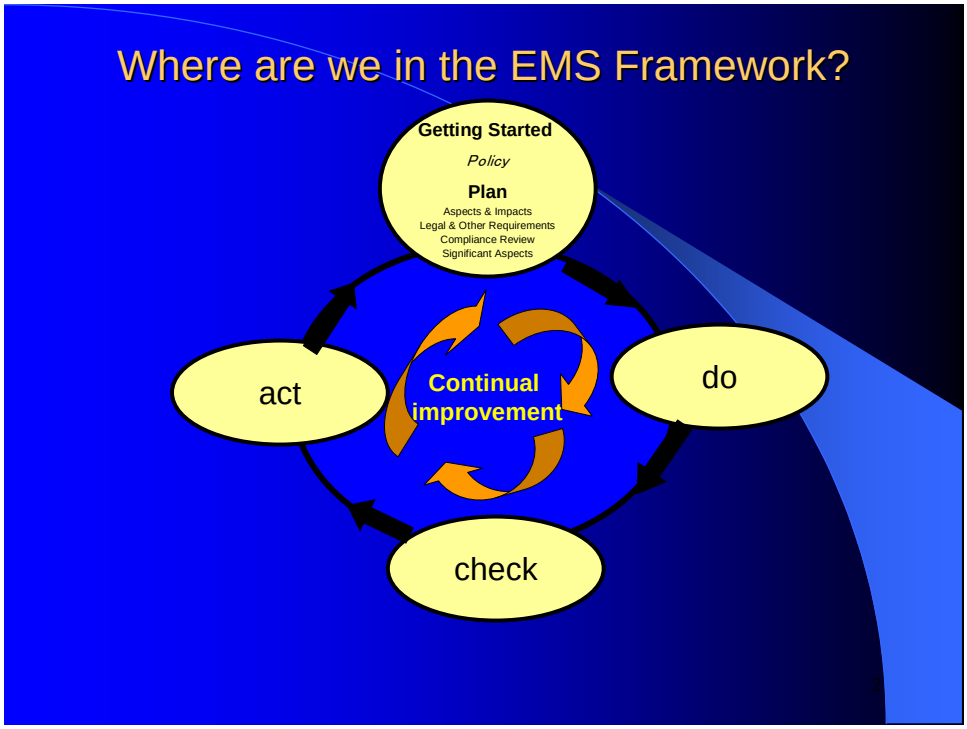
5.0 ADMINISTRATION REVIEW		
5.1 Has top management reviewed the EMS?		Phase IV: Management Review
TOTAL SCORE **(33 questions and a total of 99 points)**		

TIME TO PAUSE AND CHECK IN

Before going onto the next section, ask yourself:

- ☐ Do we have Administration support?
- ☐ Do we have a Team that represents different operations, functions, and perspectives?
- ☐ Do we have a scope of work developed?
- ☐ Have we identified existing documents and materials we can build upon and use?
- ☐ Has our team discussed the results of the gap analysis or 'crosswalk'?

The next section is about developing an environmental or sustainability policy to guide and drive actions at your college or university to improve compliance, environmental performance and sustainability.



ENVIRONMENTAL/SUSTAINABILITY POLICY: WHAT DO WE VALUE AND COMMIT TO?

What is it? An Environmental or Sustainability Policy is a declaration of a college or university's commitment to the environment and/or sustainability. The policy shows that environmental management or sustainability is a high priority and that the institution is committed to continually improving to meet its goals.

What purpose does it have? As a statement of how an institution wants to act in relationship to the environment and community, a strong, clear policy is a starting point for developing programs, sustainability initiatives and/or an EMS. It is both the foundation for and driver of your efforts. It also establishes expectations for performance.

Policies Can Change over Time

As your institution and its environmental goals change, the Policy can and should change.

As an example, an initial policy might commit to compliance and later be revised to include a commitment to pollution prevention and continuous improvement. It might then evolve into a commitment to Sustainability.

What's in it? The Policy includes an institution's environmental or sustainability 'vision'. It also should minimally include commitments to (1) Compliance with applicable environmental legislation and regulations; (2) Pollution prevention; and (3) Continual improvement.

While it is desirable to address each of these topics, circumstances and needs vary. There are many good policies that may not address each of these items directly.[19] Sustainability policies take the above commitments even further, addressing ecological, economic and societal goals. Use the sample policies (page I-33) provided as tools to guide you in drafting a policy that reflects the scope, intent, and commitment of your college or university.

What does it make possible? Internally, the Policy helps focus attention on environmental/ sustainability issues associated with activities and services. Externally, it signals a public commitment to address environmental issues, continuously improve environmental performance, and move towards sustainability.

A policy needs to show commitments. These can include commitments to compliance, pollution prevention, continual improvement, conservation of resources, stewardship and sustainable development.

Compliance ***Pollution Prevention*** ***Continual Improvement***

Why do we need a Policy? Many might ask "We've got great projects and initiatives on our campus. Why do we need to spend time developing a policy?" It is true that a campus can make improvements without a policy. However, a formal and approved Environmental Policy (or Sustainability Policy) provides a unifying theme and direction that lasts beyond one or two projects. It can be a driving force in making and maintaining changes in your institution.

[19] It should be noted that an Environmental Policy is one of the required elements in the ISO 14001 standard. If your college or university is considering certification at some point, an Environmental Policy will be required and it must include commitments to compliance, pollution prevention and continual improvement.

When should we develop a Policy? Many suggest that developing a Policy should be the first step in addressing the institution's environmental and sustainability issues. Others suggest doing so after a team has become familiar with the issues. A third option is to use the development of a draft policy as a way to start discussions on campus and /or with a Team and then continue to consider how the policy will help you achieve your goals while other elements of the management system (or projects or initiatives) are developed. Under this option, the Team can then go back and revise the draft policy as needed and start the process to discuss and get approval with senior administrators.

Why do we need a procedure as well as a Policy? A procedure describing how the Policy was developed and how often it should be reviewed makes it easier to review and revise the Policy in the future. (It's also just easier to develop the procedure earlier in the process than to go back to develop it.)

STEPS TO DEVELOP A POLICY

1. **Start with a 'Scavenger Hunt'**: Look for existing policies or related language. Identify what exists and build on it to develop a comprehensive policy.
2. **Understand your college's or university's process to approve policies:** Each institution has its own process and you will save time by knowing upfront what that process is. This may also influence how far-reaching the policy should be (e.g., applicable to one faculty, a campus within a university, a university within a network of other state institutions).
3. **Review other institutions' policies:** These are a great place to start but remember to make the policy meaningful to your college or university. There are some examples on the following pages.
4. **Work with a Team:** Discuss the purpose of the Policy and share examples. Then ask 2-3 people to develop a draft for discussion and revision.
5. **Incorporate multiple perspectives:** Develop a policy that reflects input from various perspectives; for example, chancellor/dean, department head, faculty, students, community members, and staff (environmental health and safety, maintenance, operations, etc.).
6. **Develop a "marketing plan":** Include a discussion of how to make people aware of your policy as part of the policy development effort. Make a list of groups and individuals to whom you want to distribute the policy and then match the media and method to the audience. The policy should be easily available via the web and, if appropriate, should be translated into languages other than English.
7. **Demonstrate your college or university Administration's commitment:** The importance of top management commitment to the environmental policy cannot be overemphasized. It is the cornerstone of success for an EMS or Sustainability Initiatives. Solicit input and commentary from your college or university administration and include their signatures on the policy to demonstrate understanding and commitment.

Traps to Avoid

Making oblique commitments (e.g., policies that "reflect" or "represent" commitments): Active and direct language about commitments is best.

'Word-smithing' to death: You need to spend enough time getting the team and others to understand the role a Policy can have but not so much time that the Policy is the only product you have to show after 6 months of meetings. The Policy is a tool to make improved environmental performance and sustainability initiatives a reality. It is not an end unto itself.

Getting stuck in the approval process: Understand the process ahead of time and strategize how best to work through the process, who could help (or hinder you), and how to communicate through the process.

Thinking "We'll write it and it will be done": What you do with the policy is even more important than the policy itself. Think of creative ways to communicate the policy and to link issues, actions, and accomplishments to it.

How to Publicize a Policy

Try different and creative ways to let people know that a Policy exists:

- *Publish it on the back of sports schedules*
- *Highlight it on the Web (intranet and internet)*
- *Create a mascot*
- *Create a "banner"*
- *Use it on mugs, water bottles, key chains*
- *Use it as 'taglines' in email messages, memos, and publications*

The University of Massachusetts Amherst S-T-R-I-V-E "Commitment to Strive for Environmental Excellence" includes the three required elements in an EMS in a way that reflects the University's mission and vision. http://www.umass.edu/ems-pilot/guidelines.html

Mission

The University of Massachusetts is committed to being a leader in environmental, health and safety (EH&S) by protecting the health and safety of its faculty, staff, students, visitors, neighbors and the natural environment.

Vision

The University will use its resources and encourage faculty, staff and students to take a leadership role to promote environmental awareness, education, and action. The University will continuously review all programs and, with the complete support of top administrators, provide the necessary resources for the successful design and implementation of an Environmental Management System (EMS) as we STRIVE for environmental excellence.

Environmental Principles

Stewardship - Administration, faculty, staff and students are empowered to identify the significant environmental aspects of our operations, set objectives and targets, and design and implement programs to minimize impacts on human health and the environment at a campus, community, and global level.

Train **-** Working with established training programs, each supervisor must take the initiative to train and/or manage the training of the employees and students under his/her supervision in safe work practices.

Reduce, Reuse, Recycle **-** Efforts will be made to use processes, practices, materials or products that avoid or reduce pollution. This may include process changes, efficient use of resources, material substitutions and recycling.

Improve Continuously **-** Internal staff and/or outside parties will conduct periodic audits and management reviews of the EMS to identify areas for improvement. Corrective action will be taken to address recommendations. As objectives and targets are met, new goals will be established in order to continuously improve environmental performance.

Verify Compliance **-** The foundation of the EH&S program is achieving and maintaining compliance with laws, regulations and other requirements and obligations. Where practical, we will strive to exceed and go beyond compliance with laws and regulations.

Educate the Public **-** We will continue to offer technical assistance and training opportunities to the public.

University of Missouri Rolla's Environmental Policy also includes the three elements required by ISO in an EMS. http://campus.umr.edu/chancellor/policy/I82.pdf

Purpose

This policy serves as a cornerstone of our environmental management system and provides a clear, unifying vision of environmental management by the entire University of Missouri-Rolla campus.

The environmental policy establishes UMR's commitment to:

- Prevention of pollution;
- Compliance with regulatory requirements and other requirements to which the university subscribes; and
- Continual environmental improvement

This will be a firm foundation for setting out environmental objectives and targets and this in turn will be evident in our daily activities.

Policy

- **Utilize Natural Resources Effectively** UMR will implement measures to conserve energy and raw materials including fuel and electricity.
- **Minimize Environmental Impacts** UMR will establish continual improvement processes to prevent pollution and ensure compliance with regulatory and other requirements. UMR will raise awareness among students, faculty and staff on the importance of proactive environmental management.
- **Reduce Waste** UMR will encourage recycling, implement strategies for continually reducing waste from our activities and ensure compliance with relevant environmental legislation and regulations, as well as with other requirements to which the university has subscribed.

This is an example from a private company, Pratt & Whitney, that has strong, simple and concise language: http://www.pw.utc.com/vgn-ext-templating/v/index.jsp?vgnextrefresh=1&vgnextoid=995abc5f3e7fb010VgnVCM1000000881000aRCRD

Leading the way to a cleaner, healthier environment.

Pratt & Whitney will not be satisfied until its workplace is safe from hazards, its employees are injury-free, its products and services are safe, and its commitment to and record in compliance, pollution prevention, and protection of the natural environment are unmatched.

The University of Massachusetts - Lowell's Environmental Policy also has the three elements of continual improvement, pollution prevention, and compliance as well as a phrase for their top five priorities within their environmental policy http://www.uml.edu/epaems/ems/policy.htm

As a public institution of higher education, University of Massachusetts Lowell is committed to being a model of environmental health and safety in our teaching, in our research, in our partnerships with the community, and in the management of our own organization. The University challenges and empowers each employee and student to promote environmental leadership through our environmental principle, ***"Ride the CREST":***

C: Continuous Improvement

R: Reduce, Reuse, Recycle

E: Environmental Compliance

S: Stewardship

T: Training and Education

CONTINUOUS IMPROVEMENT

...To enhance the environmental management system through checking, corrective action and annual top management review to achieve improvements in overall environmental performance.

REDUCE, REUSE, RECYCLE

...To use processes, practices, materials or products that avoid or reduce pollution, which may include process changes, efficient use of resources, material substitution and recycling.

ENVIRONMENTAL COMPLIANCE

…To meet and where practical exceed all relevant current environmental laws and regulations.

STEWARDSHIP

...To empower employees and students to identify significant environmental aspects of our activities, products, and services, and to implement programs with targets and objectives that protect the health and safety of people and the ecosystem.

TRAINING AND EDUCATION

...To provide appropriate training to all employees and students to ensure competence and awareness of our environmental policies and procedures, the significant environmental impacts of their work or activities, their roles and responsibilities in support of our environmental management system, and the potential consequences of departure from specified procedures.

Tufts University's Environmental Policy is succinct and far-reaching and identifies the both operational efficiency and awareness through education as keys to achieving its stated goal. http://www.tufts.edu/tie/environmental_policy.html

We, the Tufts University community, affirm our belief that university faculty, staff and students have a responsibility to take a leadership role in conducting activities as responsible stewards of the physical environment and using educational activities to promote environmental awareness, local action and global thinking.

In our University function, Tufts University will strive to:

- conserve natural resources and support their sustainable use;
- conduct affairs in a manner that safeguards the environmental health and safety of students, faculty, staff and communities;
- reduce the use of toxic substances and the generation of wastes and promote strategies to reuse and recycle those wastes that cannot be avoided;
- purchase renewable, reusable, recyclable and recycled materials; and
- conduct our business practices in accordance with this policy. In our education and research missions,

Tufts University will strive to:

- foster an understanding of and a responsibility for the physical environment;
- ensure that individuals are knowledgeable about the environmental and health issues that affect their discipline;
- encourage environmental research;
- conduct research and teaching in an environmentally responsible way; and
- provide a forum for the open flow of information among governments, international organizations, industry, and academia to discuss and study environmental issues and their relationship to other social issues.

In our student and employee relations, Tufts University will strive to:

- delineate individual responsibility and guide action for ensuring safety and minimizing adverse environmental impacts in the implementation of this policy.

Tufts will consider full compliance with the law to be the minimally acceptable standard and will exercise whatever control is reasonable and necessary to avoid harm to public health and the environment, whether or not such control is required by regulations.

Tufts will initiate, promote and conduct programs that fully implement this policy throughout the university and the global community.

Brevard Community College's policy is a simple statement recognizing the potential for improvement and lists specific objectives supporting that initiative.

Policy Regarding Protection of the Environment

The Board of Trustees recognizes that the educational and responsible use of natural resources and protection of the environment is consistent with the standards of Brevard Community College and all its students and work family, and the Board recognizes a tremendous potential exists for improvement which is more in harmony with the ideas of the College. Therefore, Brevard Community College reaffirms these principles by adopting this policy related to sound environmental management and encourages all staff and students to be aware that:

- All buildings will be constructed with the utmost concern for their environmental impact
- The College will pursue a sound program for energy efficiency and conservation
- The college will ensure that proper handling and disposal be conducted for all hazardous waste materials
- The college will seek alternatives to products which are environmentally detrimental
- All faculty and staff are encouraged to implement and update periodically an awareness program of education in the conservation of energy, the recycling of materials and the handling of hazardous waste

Ball State University's "Sustainability Statement"

http://bsu.edu/sustainability/

Vision:

Ball State University seeks to be a campus where:

- All students, faculty and employees are provided opportunities to become literate in the environmental, social and economic interactions of human and biophysical systems.
- Such opportunities are made available through strong undergraduate and graduate programs, as well as professional-specialization, faculty development and staff training offerings that provide diverse opportunities for learning.
- Collaborative faculty and student research on related issues is encouraged and supported.
- Development of university leadership and expertise is seen as a continuous, participatory process of learning that contributes to local and regional sustainability efforts, fostering links with other institutions.
- Understanding and concern for sustainability issues provide the foundation for a dynamic sense of campus cohesion and community.
- The University's practices reduce both the consumption of materials and energy and the emission of pollutants to their lowest levels possible, without decreases in the level of education, scholarly work, and services provided.

Commitment:

We, the Ball State University community, affirm our commitment to protect and enhance the environment through our learning, research, service and administrative operations. We seek to foster a community that sustains ecological systems and educates for environmental awareness, local action, and global thinking. We seek to incorporate environmental principles and environmentally responsible practices as fundamental and integrated components of all BSU operations and programs. Our fundamental principles are to:

- Incorporate environmental concerns as a significant priority in university decision making.
- Seek alternative practices and procedures to minimize negative impacts on the environment.
- Conserve natural resources and restore environmental quality.
- Protect the biodiversity of our region and serve as a living laboratory and habitat for local species.
- Consider the social, economic and environmental impacts of Ball State University's operational policies and foster a participatory process in developing these policies.

Our decisions and actions will be guided by the University's Mission Statement, reflective of the University's resources, and informed by the University's Strategic Plan. As a learning institution, we recognize that planning for sustainability will be an evolving practice.

SAMPLE PROCEDURE DOCUMENTING HOW A POLICY IS DEVELOPED.

University Of Massachusetts Amherst	EMS Procedure	1.1
	Title	Environmental Policy
	Effective Date	

CONTENTS

1.0 Purpose, Applicability and Scope

1.1 Purpose

This procedure documents and describes the method used to develop an EH&S policy for the University of Massachusetts Amherst Environmental Management System (EMS).

1.2 Applicability

This procedure applies to the EH&S policy developed for the Lederle Graduate Research Center, Tower A, Chemistry and Biochemistry pilot EMS.

1.3 Scope

The intent of the EH&S policy is to define our commitment to the environment through continual improvement in environmental performance. The policy serves as a starting point for developing an EMS. It addresses pollution prevention and compliance with environmental regulations. Within the University (faculty, students, staff), the policy focuses attention on environmental issues associated with activities and services. Outside the University (regulators, community), the policy is a public commitment to addressing environmental issues and continually improving environmental performance.

2.0 Abbreviations, Acronyms and Definitions

2.1 Abbreviation, Acronyms

- **EH&S** - Environmental Health and Safety.
- **EMS** - Environmental Management System

2.2 Definitions

- **EH&S Policy** - A University statement of our intentions and principles in relation to our overall environmental performance. The policy provides a framework for action and a backup for our environmental objectives and targets.
- **Environmental Management System** - A continual cycle of planning, implementing, reviewing and improving the actions that we take to meet our environmental obligations.

3.0 Roles and Responsibilities

The ultimate responsibility for the campus safety and environmental health rests with the Chancellor. The Chancellor has delegated to each dean, director, chairperson, and supervisor the responsibility for safety performance within their respective unit. Faculty, staff and students have an obligation to take all reasonable precautions to prevent injury to themselves or to their fellow employees or students.

4.0 Procedure

- UMass EH&S drafts the policy for internal review
- The policy is reviewed by the EMS Core and Sponsor Teams
- The policy is finalized for signature by top level administration officials
- The policy is made available to UMass faculty, students, staff, and the community
- EH&S reviews the policy at least annually and updates it if needed

Appendix 1

Procedure Administration

1. Document Changes

Revision No.	*Description of Change*	*Effective Date*

2. Document Owner EH&S Department

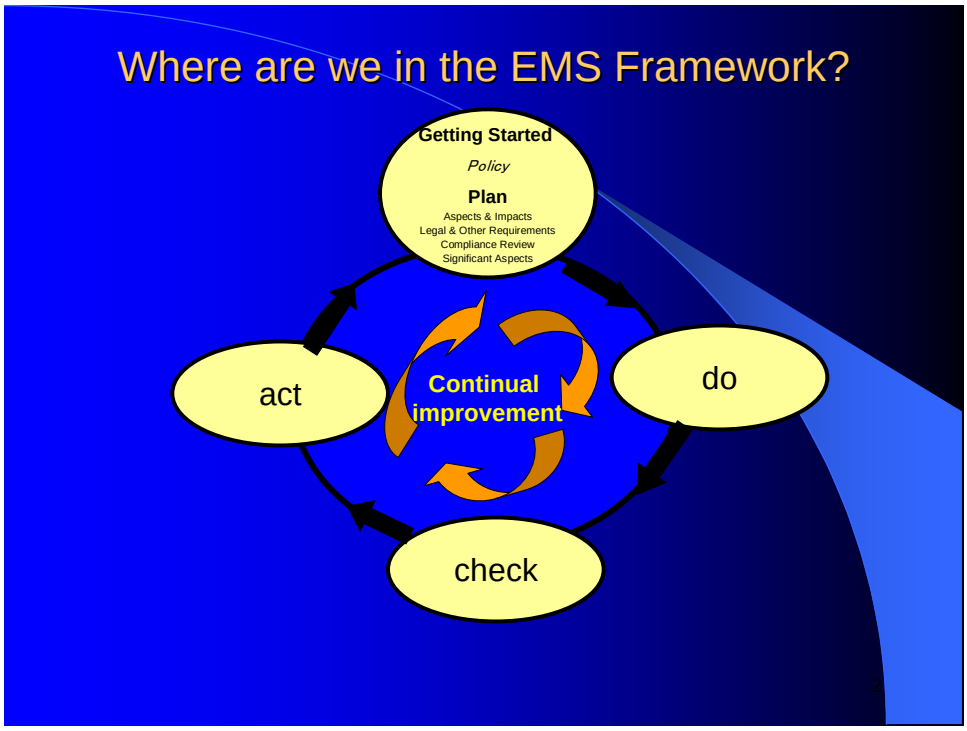
3. Document Location S Manual

4. Document Author R. _____

5. Documents Referenced EH&S Policy

6. Audit Requirements At least annual

TIME TO PAUSE AND CHECK IN



The above shows where 'Getting Started' and 'Policy' fit in the management system cycle. The 'PLAN' elements are discussed next.

Before going onto the next section, ask yourself:

- ☐ Do we have a clear understanding of the scope of our effort?
- ☐ Is our team functioning well?
- ☐ Have team members increased their level of awareness and knowledge?
- ☐ Do we have a communication and rollout strategy?
- ☐ Is the status of our Policy good enough for now so that we can move ahead?

AND

- ☐ ***Scope:*** Is it clear what we are trying to accomplish and how much we are going to cover? (i.e., Are we going to focus on compliance? Individual projects? An EMS? A Sustainability Initiative?)
- ☐ ***Team:*** Do we have the people we need? How will the Team communicate to others about their work, accomplishments and needs?

☐ ***Policy:*** What are the plans to get it approved? How will it be communicated on campus, to contractors/vendors, to the community?

☐ ***Documentation:*** Do we have a written procedure that documents how the policy was developed, how often it will be revisited, etc.?

☐ ***What's working well in how we are developing our project, EMS or Sustainability Initiative? What could be improved?*** Write down 3 things you will continue to do and 3 new things you will try.

WHAT'S NEXT?

1. Finalize the policy and get it approved
    a. Document a procedure that outlines how often the policy should be reviewed
    b. Develop a strategy and methods to communicate it.
2. Continue forward to assess operations (Aspects and Impacts).
3. Find out the status of compliance (Legal and other Requirements; Compliance Review).
4. Decide what you should focus on first (Significance).

PHASE II: PLAN

Phase II "Plan" includes the following steps and tools that can be used to continue the development of an EMS, a Sustainability Initiative or individual environmental, compliance improvement or pollution prevention projects:

Identifying Aspects and Impacts: Understanding how and where your institution interacts with the environment and community.

Identifying Legal and Other Requirements/Compliance (page II-22)**:** Understanding what your institution needs to know and pay attention to in order to be in compliance.

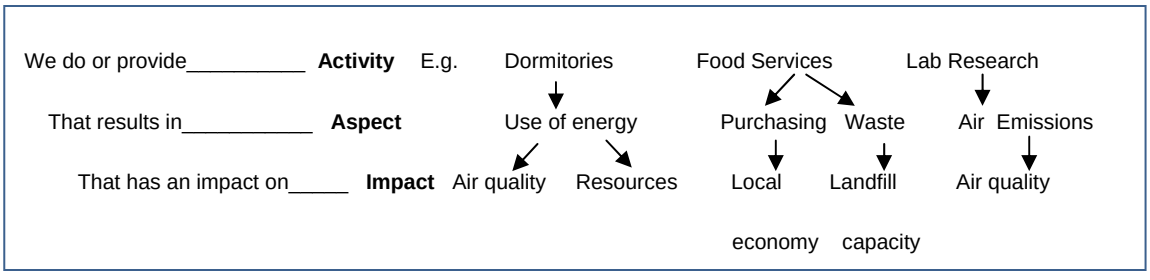
Prioritizing Significant Aspects (page II-43)**:** Deciding what to work on first.

Setting Objectives and Targets (page II-55)**:** Deciding what you want to improve or achieve, by how much, and by when.

IDENTIFYING ENVIRONMENTAL ASPECTS AND IMPACTS: WHAT ACTIVITES AFFECT THE ENVIRONMENT?

This phase of the process assesses how a campus affects the environment and community. This can be particularly difficult because colleges and universities operate like a small town with a wide variety of activities, each with its own set of aspects and impacts. Operations typically include chemical and biological laboratories, residential life, food service, fleet operations, facilities management, grounds maintenance, information technology, library services, etc. These operations require the use of energy, water, chemicals, food, land, and materials while they also generate emissions, waste disposal, and other discharges and can have far-reaching impacts on the community.

What is it? Identifying environmental aspects[20] and impacts is a way to better understand how your institution interacts with the environment. You can do this in the broadest sense if you are interested in developing a sustainable campus by including not only the natural environment but also the social and economic environment in which you operate. This analysis is a kind of scan of your college or university operations through an environmental and/or sustainability 'lens'. If you want to prevent, control and reduce the environmental (and/or social and/or economic) impacts of your campus' operations, you first need to know what the impacts are, how significant they are, and what is causing them.



[20] An environmental aspect is, according to the definition in ISO 14001 an element of an organization's activities, products, or services that can interact with the environment; Aspects may have an impact defined as, "Any change to the environment…wholly or partially resulting from an organization's environmental aspects.".

Typical aspects: Air emissions, Releases to water, Waste generation, Fuel usage, Contamination of land, Water consumption, Use of raw materials, Energy consumption, Noise, Odor, Dust, Visual/Landscape.

What purpose does it have? Whether developing an EMS, Sustainability Initiative, or individual projects, you need to know where and how your operations, activities and services affect the environment and community. Environmental aspects and impacts is a way to start.

What's in it? It includes a list of activities, their aspects (what they produce or cause in terms of the environment), and their impacts (effects). This list includes things that your institution can control and over which it can have an influence.

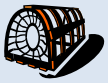
What does it make possible? This step is the basis for deciding what to work on first in order to control, reduce or prevent impacts. Going through the process also increases a team's shared awareness and understanding of where and how operations and activities affect the environment and community.

Tips Try to get through the aspects and impacts identification as quickly as possible to gain momentum, establish a systematic approach that works for your institution, and then revisit the aspects and impacts review later as needed.

Don't forget to include regulated aspects (e.g., emissions and discharges), non regulated aspects (e.g., energy/water use), emergency situations (e.g., spills) and positive impacts (e.g., water re-use, recycling).

Why do we need a list of Aspects and Impacts? Without some kind of disciplined approach to identifying how and where your institution interacts with the environment, you run the risk of either missing some key areas and opportunities and/or working on a 'wish list' developed by one or two people. Aspects and impacts give you the foundation and buy-in to proceed.

When should we develop Aspects and Impacts? If you are developing an EMS, work with your Team to develop a list of Aspects and Impacts early in the process. If you are developing a Sustainability Initiative or individual projects, you can also use this EMS tool to begin to identify priorities.



Trap to avoid

While it is important to accurately identify environmental aspects and impacts, it can be easy to get caught up in this step and delay progress forward. You should concentrate on working through the process with the end point in mind and the continual improvement cycle will bring you back for another look once you've had some experience.

Why do we need a procedure? The procedure that accompanies the List of Aspects and Impacts documents how the Team developed the original list. This can be used to support future budget and other requests, revise the list, and/or apply the approach to other parts of the campus. ***NOTE:*** If you think you will pursue ISO certification, you will need both the list and the procedure. ISO 14001:2004 requires that you "establish, implement and maintain a procedure(s) to identify the environmental aspects… within the defined scope of the environmental management system that it can control and influence taking into account planned and new developments, or new or modified activities, products and services."

DEVELOPING A LIST OF ASPECTS AND IMPACTS

Remember that there are many ways to develop a list of aspects and impacts! (page II-7) Develop an approach that works for you.

The most important use of aspects and impacts is to get a handle on the impact of your campus (or department, or activity - whatever fenceline you've chosen) on the environment and to use the catalogue or listing of activities, aspects and impacts that you develop with this process to determine what to work on. You want to begin to address your most significant impacts first, but you can simultaneously work on projects that might not address the greatest impacts in order to help build your team and show success in the early stages of this process.

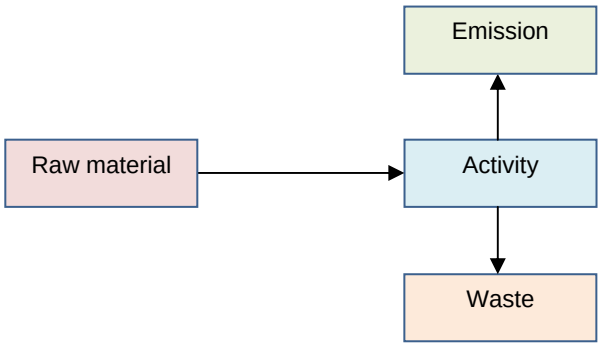
Note that ISO includes the identification of aspects/impacts and ranking of significant aspects (page II-46) as one element. The approach in this guide is to break these into two parts because in practice, teams first develop lists and then review and rank for significance.

STEPS TO IDENTIFY 'SIGNIFICANT' ASPECTS AND IMPACTS

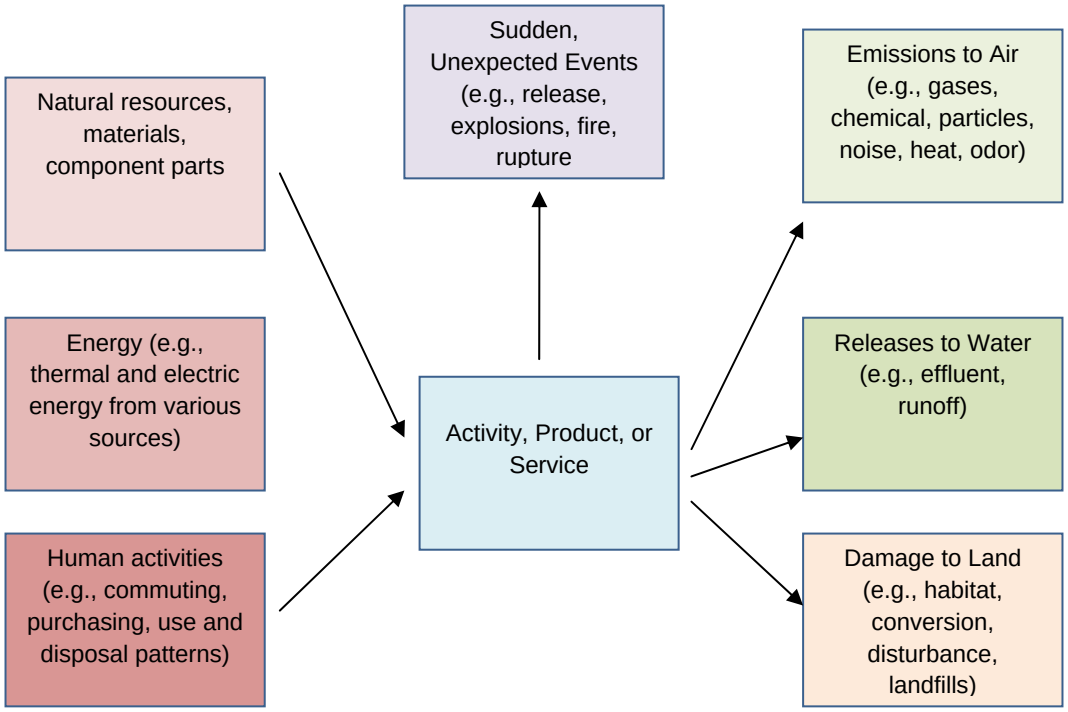
1. Identify main activities, products or services within your 'fenceline'
2. List the environmental/community aspects
3. Decide if they are under your control and influence
4. Identify related environmental/community impacts
5. Decide if the aspects are 'significant'

You can also use the Sustainability Development Planner at http://www.gemi.org/sd to develop a catalogue of impacts and to help prioritize what is most important to you and your campus champions.

Many use an input/out model to stimulate thinking about how activities, products or service interact with the environment. A simple model (anything that goes into or out of the Activity box may cause impacts):



A more detailed model is presented below[21]



[21] Adapted from *Implementing the ISO 14001Environmental Management System Specification, Version 2.0.* James H. Schaarsmith, p. 32 http://www.deq.state.va.us/veep/pdf/isoguide.pdf.

FLOW CHARTING

Many teams find it very useful to develop visual charts or maps of their operations to identify aspects and impacts. Charting the process or activity makes it easier to see associated impacts, opportunities to improve decision-making and prevent pollution.

See Cornell University's one page explanation of flow-charting (page II-10).

For process mapping or input/output diagrams, see *An Organizational Guide to Pollution Prevention*, EPA/625/R-01/003, August 2001, page 61: http://www.p2ric.org/CachedPages/printguid.pdf, and *An Implementation Guide for Small and Medium-Sized Organizations* at http://www.epa.gov/owm/iso14001/ems2001final.pdf, p.170.

Also see information about process mapping at http://admin.utep.edu/Default.aspx?tabid=28945 and http://www.fpm.iastate.edu/worldclass/process_mapping.asp.

Some organizations like the 'eco-mapping' approach at http://www.ecomapping.org/sansflash/download.php. Additional instructions are at: http://www.cahs.colostate.edu/ccp/PDF/Instructions%20for%20Ecomapping%20Exercise.pdf

See what works best for you.

Tips

- Make sure you have people at the table who know the operations you are reviewing but….
- Encourage people to learn and ask questions about operations they do not usually work in—some of the best ideas come from people who are outside an operation
- Remember your goals – to understand what activities have impacts and to be able to address significant impacts. Keep this in mind while you are doing your analysis
- Keep at it—find a format and level of detail that works for you

Traps to Avoid

Getting lost in the details: Watch out for getting lost in the 'bug-dust'.

Making it perfect: It doesn't have to be 'right' the first time.

Forgetting why you're doing this: Remember, this is not an academic research effort. You need this information to be able to make reasonable decisions and move towards action. Make sure it is understandable.

Getting frustrated when the process is not moving as fast as you'd like: Ask an outside facilitator for assistance. Understand that this can be a challenging step and that you will get stuck. It's not a question of "if" but only of "how long". The most effective teams recognize they are stuck and take action to move on.

How Can We Get the Team to Get Through This Step?

1. Decide what activities are included in your 'fenceline' or scope.
2. Develop a common understanding of the terms and examples for aspects and impacts and why this step is important (see Cornell University's handout Aspect/hazard/impact/risk (on page II-11.
3. Look at examples from other colleges and universities and decide which approach might work for you.
4. Try it! Then assess whether the approach is working or not and whether you need to rethink your fenceline or tools you are using. Use process maps, flip charts, maps, whatever it takes to brainstorm what, where and how operations and activities interact with the environment.
5. See if you need to collect any information to help you in this effort. Even though measurement is not a focus in this part of the process, it is useful to collect baseline information as soon as possible. You may find that having information (e.g., energy use, water use, chemical purchasing, cleaning products currently used, waste generation, emissions per permit conditions) is extremely helpful in this initial stage (and later on when measuring progress).
6. Try it again. One of the deliverables will be some kind of matrix that can be as simple as a table or spreadsheet that lists activities and impacts. *Note:* Assign someone the responsibility for documenting how the Team developed the list and make it into a procedure now rather than later (sample follows).
7. Remind people that this is a key step to address the most significant environmental issues of your campus.

DEVELOPING A LIST OF ASPECTS AND IMPACTS

A potential handout/worksheet for a Team to begin developing a list follows. We have tried to include some of the typical aspects and impacts as well as a few examples of some of the potential positive aspects and impacts of projects that might demonstrate a more sustainable approach. This table shows that impacts, such as air pollution, can result from multiple activities. Down the line, when you analyze which impacts are the most significant, you'll need to re-assess from the point of view of the activities they are associated with.

Operation	Activity	Aspect	Impact
We provide_____	We do_____	That results in_____	That has an effect on_____.
Food Service	Preparation of food Disposal of food scraps Washing up Purchases from local growers	Electricity Use Water Use Solid Waste Food Waste Sustains local farming	Air Pollution Resource Consumption (water, energy, food) Landfilling Economic health of region and/or community preservation
Grounds Maintenance	Application of fertilizers and pesticides Watering of grounds Pruning, mowing Organic landscaping	Fuel Use Pesticide/Fertilizer Use and potential spills Green Waste Healthy Habitat	Air Pollution Pollutant Runoff Compost Resource conservation
Dormitories/ Residential life	Provision of lights, HVAC services Painting Cleaning Bathroom facilities Generation of wastes	Electricity Use Water Use Wastewater Solid waste (regular) Solid waste (end of year) Local employment	Air Pollution Resource Consumption (water, energy, food) Water quality impairment Landfilling Economic or health disparities
Teaching Laboratories	Teaching experiments Research experiments Curriculum development	Use of chemicals Hazardous waste Preserved biological specimens Radiological materials Spills Long term changes in behaviors	Indoor air quality issues Water quality impairment Exposure Unsafe working and teaching conditions Training of a generation in preservation of resources

Operation	Activity	Aspect	Impact
We provide_____	We do_____	That results in_____	That has an effect on_____.
Fleet operations	Maintain fleet Operate vehicles Wash vehicles Purchase vehicles Dispose of vehicles	Use of oil Use of hazardous materials Spills Resource Use Solid/hazardous waste	Indoor air quality issues Hazardous waste disposal Exposure
Art Department	Paintings Sculptures Printing Firing of clay art Photography	Use of materials Fuel use Use of energy Chemical use	Indoor air quality issues Air pollution Unsafe working and teaching conditions Resource consumption Landfilling
Construction, Demolition	Removal of building materials Rehabbing of buildings New building construction Use heavy equipment Reuse materials	Use of materials C&D waste disposal Dust and air emissions Reuse of materials	Resource consumption Landfilling Air pollution Unsafe working and teaching conditions Conservation of resources
Energy	Provide energy on site Purchase energy	Fuel use	Resource consumption Air emissions
Building Maintenance	Interior cleaning Pest control Painting	Water use Chemical use Waste disposal Air emissions	Resource consumption Air emissions Landfilling

Note that a number of the operations and activities include potential for spills which may be significant. Phase III: DO!, includes approaches to address emergency preparedness and response.

WORKSHEET A

Worksheet A, below, can help your Team evaluate and document environmental aspects and impacts, enabling your team to objectively compare the environmental effects of your operations. Another kind of worksheet can be found at: http://www.ehs.wsu.edu/EMS/emseaspects.asp.

Environmental Aspects and Impacts		**Completed by:** _____ **Date:**_____
List one activity, product or service. Then identify all of the environmental aspects for that activity, product or service. Repeat. Then identify the environmental impact for each aspect.		
Activity, Product or Service	Environmental Aspect	Environmental Impact

Following the samples is a procedure to document how the Aspects and Impacts were developed and when the list will be reviewed and possibly revised in the future.

What is the purpose of a flowchart?

A flowchart visually displays the sequence of activities in a process and who is responsible for those activities.

What symbols are used in flowcharting and what do they mean?

The following are the common symbols used in flowcharting:

Action — A rectangle represents an activity to be completed.

Decision — A diamond represents a decision to be made.

Start/End — A terminator shape or a circle represents the beginning or end of a process.

Document — This shape represents something that is documented.

Process — A rectangle with lines represents a pre-defined process

Arrow — An arrow indicates the process flow.

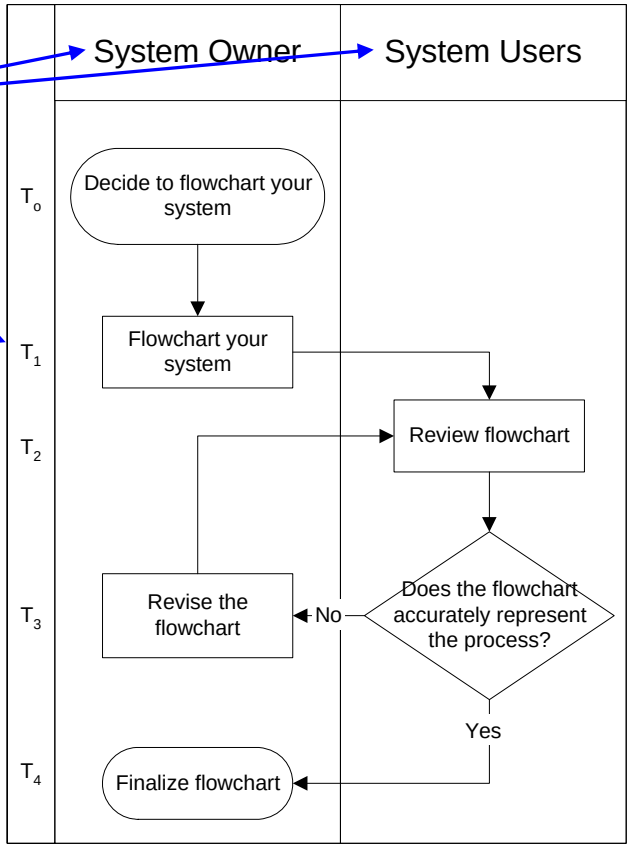
How do I show responsibilities on a flowchart?

Responsibilities are represented by the columns on a flowchart. The flowchart symbols are placed within the column of the person or group responsible to complete that item.

How do I indicate timeframe on a flowchart?

Time can be indicated down the left side of the flowchart. Any appropriate timeframe can be used. Examples include:

T=0	Monday	Feasibility
T+1 day	Wednesday	Conceptual
T+5 days	Saturday	Definition



How do I get started?

It's easiest to create a flowchart by using post-it notes on a chart pad. Post-it notes allow you to move things around as you work through the process.

1. First identify the purpose of the process.
2. Then identify the people or groups involved in the process. Put one role per post-it note and place them across the top of the chart pad.
3. Work through the steps in the process flow, writing each step on a post-it note and placing it on the chart pad. Move them around as necessary to reflect the process.
4. Once have all the steps identified and appropriately oriented on the chart pad, add the arrows to indicate the work flow.

HANDOUT: ASPECTS, HAZARDS, IMPACTS & RISKS

The Cornell EMS Elements require that an organization define its safety, health and environmental aspects and impacts. From these, significant aspects will be defined based on things like risk, frequency, regulatory and legal liability, interest of the community, and other factors important to the individual organization.

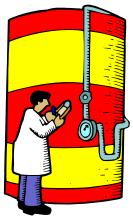
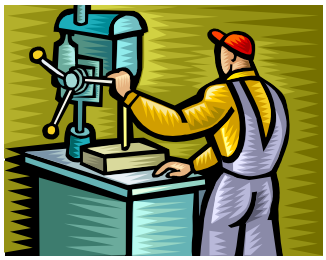
Definitions:

Aspect – a component or element of Cornell's research, teaching, service, extension, or support activities that can affect the safety or health of individuals or that can interact with the environment.

Hazard – a condition, set of circumstances, or inherent property that has the potential to cause adverse safety, health or environmental impacts.

Impact – any change to the safety or health of individuals or the environment, whether beneficial or adverse, wholly or partially resulting from an aspect of the organization's research, teaching, service, extension and support activities.

Risk – an estimate of the combination of the likelihood of an occurrence of a hazardous event or exposure, and the severity of injury, illness, or environmental impact that may be caused by the event or exposure.

Adverse Example	Environmental	Health & Safety
Activity	Coal burning in boiler 	Internal tank repair 
Aspect (thing)	Air emissions	Confined space
Hazard (condition)	Ozone alert day	Low oxygen atmosphere
Impact	Decreased air quality	Suffocation
Risk (qualifier)	Probability of decreased air quality	Probability of suffocation
Activity	Plastics recycle 	Machine shop work 
Aspect (thing)	Plastic bottle	Machine guarding
Hazard (condition)	Not applicable	Not applicable
Impact	Reuse material Reduced materials to landfill	Prevents injury to hands
Risk (qualifier)	**Not applicable**	**Not applicable**

	ENVIRONMENTAL MANAGEMENT SYSTEM (EMS) **Massachusetts Department of Environmental Protection Senator William X. Wall Experiment Station (WES)** **37 Shattuck St., Lawrence, MA**	**Date:** **April 6, 2001** **Page** **Revision #** **Draft 1.0**
WES EMS Document #: November 14_Phase II.doc D1.0		**Prepared by** WES EMS Core Team
WES EMS Document Title:	**Aspects Identification/Macro Map – Inorganic Laboratory**	**Approved by** *Oscar C. Pancorbo, Ph.D., Director, WES*

Aspects Identification/Macro Map: Inorganic Laboratory

	Activities, Products, Services	Environmental Aspects
I. Inputs		
1. Plastic sampling containers.	Samples collected from regional offices and transported to WES	1. Solid waste generation of emptied containers. 2. Hazardous waste generation if sample is confirmed to be hazardous; must be properly stored. 3. Gasoline consumption in transport
2. Glassware used in preparation of sample analysis.	Glassware used in laboratory. Disposable plastic products used in sample preparation.	1 Solid waste generation. 2. Safety issue with vapors.
3. Chemical and gas purchase and storage	Ordered chemicals and instrument gases stored in garage, laboratory, and chemical storage room.	1. Accident potential with tanks and chemicals during transport or sample preparation and analysis; spills, leaks. 2. Solid waste generation.
II. Processes		
1. Sample preparation for analysis	Samples prepared in fume hood with necessary acids, peroxide and chemicals.	1. Air emissions of acid vapors. 2. Breathing fugitive vapors. 3. Hazardous waste generation. 4. Fume hoods constantly running use electricity. 5. Solid waste generation from disposable lab ware.
2. Sample storage	Samples are stored in plastic bottles and kept on carts in laboratory.	1. Air emissions of acid vapors. 2. Breathing fugitive vapors. 3. Hazardous waste generation. 4. Fume hoods constantly running use electricity.
3. Prepared sample analyzed on scientific instrumentation	Plastic sample vials/cups are used for instrumental analysis.	1. Solid waste generation. 2. Hazardous waste generation. 3. Instruments continually running use electricity.

III. Outputs		
1. Printed data from instruments. Copies of reports made.	Hard copies from data generated from instruments printed on paper. Data transcribed onto laboratory notebooks and printed copies of reports filed.	1. Solid waste generation if excess paper utilized. Print heads and toner cartridges also contribute to solid waste generation if not recycled. 2. Printer uses electricity when left on.
2. Acid, chemical and sample waste disposal.	Laboratory generated chemical waste stored and disposed.	1. Possible spills on premises. 2. Employee exposure. 3. Hazardous waste generation. 4. Solid waste generation from chemical containers.

LIST OF REVISIONS

Rev. #	Date	Description of Revision	Page #
1.0	April 6, 2001	None	

	ENVIRONMENTAL MANAGEMENT SYSTEM (EMS) **Massachusetts Department of Environmental Protection Senator William X. Wall Experiment Station (WES)** **37 Shattuck St., Lawrence, MA**	**Date:** **April 6, 2001** **Page** **Revision #** **Draft 1.0**
WES EMS Document #: November 14_Phase II.doc D1.0		**Prepared by** WES EMS Core Team
WES EMS Document Title:	**Aspects Identification/Macro Map – Building Maintenance**	**Approved by** *Oscar C. Pancorbo, Ph.D., Director, WES*

Aspects Identification/Macro Map: Building Maintenance

	Activities, Products, Services	Environmental Aspects
I. Inputs		
1. Building maintenance consumables.	Cleaning agents, fertilizers, and paper products purchased for maintenance of building and grounds. Products contained in various packaging.	1. Solid waste generation of packages. 2. Solid waste generation of paper towels. 3. Cleaning agents and fertilizers contribute phosphate, ammonia, or other chemical waste streams.
2. Employees bring food, paper, and other personal items to work.	Food, food containers, publications, and other consumer products brought to work.	1. Solid waste generation.
3. Water usage	Water is used for cleaning laboratory glassware, floors, lunchroom utensils, state vehicles, watering lawn, and bathrooms.	1. Excessive usage of water.
4. Electricity	Electricity used in all aspects of building; lighting of rooms, operation of electrical equipment and computers. Maintenance staff replace or fix light fixtures and electrical equipment.	1. Excessive energy usage. 2. Solid waste generation with non-operating fixtures. 3. Hazardous waste generation with old electrical equipment and non-operating light fixtures.
5. Natural gas	Natural gas used to heat boiler.	1. Excessive energy used. 2. Air emissions.
6. Gasoline purchased for power equipment.	Gasoline purchased and stored in building.	1. Possible explosion or spill if improperly stored. 2. Air emission. 3. Gasoline usage.

II. Processes		
1. Trash collection	Collected trash disposed in dumpster.	1. Solid waste generation.
2. Vacuuming & washing floors	Various types of vacuums used. Cleaning agents used to wash floors.	1. Excessive noise from vacuums. 2. Redistribution of unfiltered particles/pathogens into air. 3. Electricity consumption with vacuums. 4. Cleaning agents contribute to unpleasant odors. 5. Cleaning agents contribute phosphate, ammonia, and other chemicals into sewer system.
3. Lawn care & snow removal	Lawn mower maintained and used to cut lawn. Lawn clippings and debris disposed in dumpster. Fertilizer used on lawn. Snow blower used to clean snow from walkways and sidewalks. Sand/salt used to clear ice from parking lot.	1. Storm water runoff from lawn and parking lot. 2. Air emission from power equipment. 3. Solid waste generation from lawn clippings and debris.
4. Mail delivery	If packages need to be delivered to post office, state vehicle used.	1. Air emission. 2. Gasoline usage.
5. Painting	Latex based paints used to renovate rooms of facility	1. Solid waste generation from brushes, rags and empty paint containers 2. Odor of paint may cause problems to some individuals. 3. Hazardous waste if excess paint not needed.
III. Outputs		
1. Disposal of unwanted items.	If items within building cannot be utilized or surplused, item will be disposed in dumpster.	1. Solid waste generation.

LIST OF REVISIONS

Rev. #	Date	Description of Revision	Page #
1.0	April 6, 2001	None	

Aspects Identification/Macro Map: Administration

	Activities, Products, Services	Environmental Aspects
I. Inputs		
1.	Mail, Paper	Unwanted Junk Mail Process significantly reduces unwanted mail. Paper: Uses renewable resource 30% total recovered fiber paper.
2.	Electricity	Uses non-renewable resource - energy consumed. Copier has "Energy Star" rating. Old drafty windows prohibit full conservation
3.	Office Supplies	Uses renewable and non-renewable resources - remanufactured toner cartridges
4.	Cleaning Supplies	Uses Environmentally Preferable Products when available
II. Processes		
1.	Mailings	Unwanted junk mail results in excess use of paper
2.	Use of Lights/Air Conditioning/Office Machinery	Excessive use of Electricity - waste of non-renewable resource
3.	Printing/Copying/Faxing	Excess use of paper - waste of renewable resource.
4.	Procurement/Use of Cleaning Supplies	Non-use of toxic cleaning agents
5.	Procurement /Use of Office Supplies	Excess use of office supplies results in excess solid waste. Use of non-recycled office supplies

III. Outputs		
1.	Unwanted Mail	Increases amount of solid waste
2.	Lights/Air Conditioning/Office Machinery	Excess use of electricity by not shutting off fixtures during non-working hours results in higher electric bills, decreases available resource
3.	Empty toner cartridges	Excess solid waste if not recycled/sent back to manufacturer
4.	Cleaning Supplies	Potential hazard to employees, water supply

LIST OF REVISIONS

Rev. #	Date	Description of Revision	Page #
1.0	April 6, 2001	None	

SAMPLE PROCEDURE – REVISE AS NEEDED

[C/U Name]	EMS Procedure	2.1
	Effective Date	
	Subject	Environmental Aspects and Impacts

Purpose This procedure is used to identify, document, and update the environmental aspects and impacts of the [college/university name] activities and services.

Step 1 The EMS Manager and other EMS Participants selected by the EMS Manager are responsible for identifying and prioritizing the environmental aspects and impacts of [college/university name] operations during EMS planning and development.

Environmental aspects are characteristics of [college/university name] operations that interact with the environment. Only environmental aspects [college/university name] can control or influence will be considered.

Environmental impacts are the effects of [college/university name] activities or services on the environment.

Step 2 Environmental aspects and impacts will be documented and prioritized using Aspects Forms A and B [attach]and other methods, as listed below:

_____

_____

_____

Additional environmental aspects relevant to the [college/university name] operations will be evaluated as needed. Significant environmental aspects and impacts will be considered when environmental objectives and targets are set.

Step 3 The EMS Manager and other EMS Participants will review and update the environmental aspects and impacts documentation annually.

Step 4 Environmental aspects and impacts documentation will be retained at [college/university name] for at least 2 years.

EXAMPLE OF A PROCEDURE: ASPECT & IMPACT EVALUTION AND SIGNIFICANCE DETERMINATION

Cornell University Central Heating and Chilled Water Operations

Procedure No. CMS-UTIL-001 Issue Date: 2/8/06
Rev. #0
Author: C___ H____ Approved By:

I. Purpose: To identify the environmental aspects and impacts of the Utilities Steam Production through Coal process, which can be controlled or influenced and that can interact with the environment in a positive or negative manner. The procedure also describes the process used to identify the significant aspects that will be considered for setting objectives and targets.

II. Prerequisites: Definitions:

Activity – a process, operation, maintenance activity or other.

Environmental Aspects – are defined as those elements of the activities that can interact with the environment.

Environmental Impact – any change to the environment, whether adverse or beneficial, wholly or partially resulting from the activity.

Environmental or Other Req. – Mark as Yes if the activity is regulated by an environmental requirement, university standard, or policy.

Severity of Potential Impact – ranking of how severe the potential impact of a defined aspect might be. "High" might be something that's an immediate danger to human health or the environment. "Medium" is the minimum rating for a compliance related aspect/impact. "Low" might be for something voluntary or something that has little to no impact on human health or the environment.

Likelihood of Potential Impact – ranking of how likely it is that this aspect and impact would occur (i.e. What are the odds that it will happen?)

Opportunity to Control – ranking of the ability to control or influence the outcome of an aspect

Frequency of Activity – ranking of how often the activity occurs, on average

III. Instructions:

1. The Pilot Team members will each be responsible for identifying a draft list of the aspects for their respective specialty areas. (Use the Aspect Impact Assessment form located on SharePoint at: [intranet site or physical location].
2. The Pilot Team will then meet and review the aspects and impacts as a group
3. The Pilot Team Leader will help identify any aspects that may have applicable local, state or federal regulations.

4. Each Pilot Team member reviews their respective aspects against the following significance criteria:

Severity of Potential Impact	Opportunity to Control
Likelihood of Potential Impact	Frequency of Activity

5. Each aspect is evaluated against each of the significant aspect criteria above. As a team, the rankings for each significance criteria will be agreed upon.
6. The scores are totaled using the calculation in the aspect worksheet.
7. The Pilot Team will use the numerical ranking as a starting point for discussion to identify significant aspects which will be taken into consideration when setting Objectives and Targets, development of operational controls, training, etc.
8. The significant aspects shall be reviewed with the Plant Manager for approval and comment as necessary.

IV. **Responsibilities:** The Pilot Team is responsible for compiling the list of significant environmental aspects associated with the activities. The Plant Manager shall review this and provide comments as necessary.

V. **Example Aspects & Impacts**

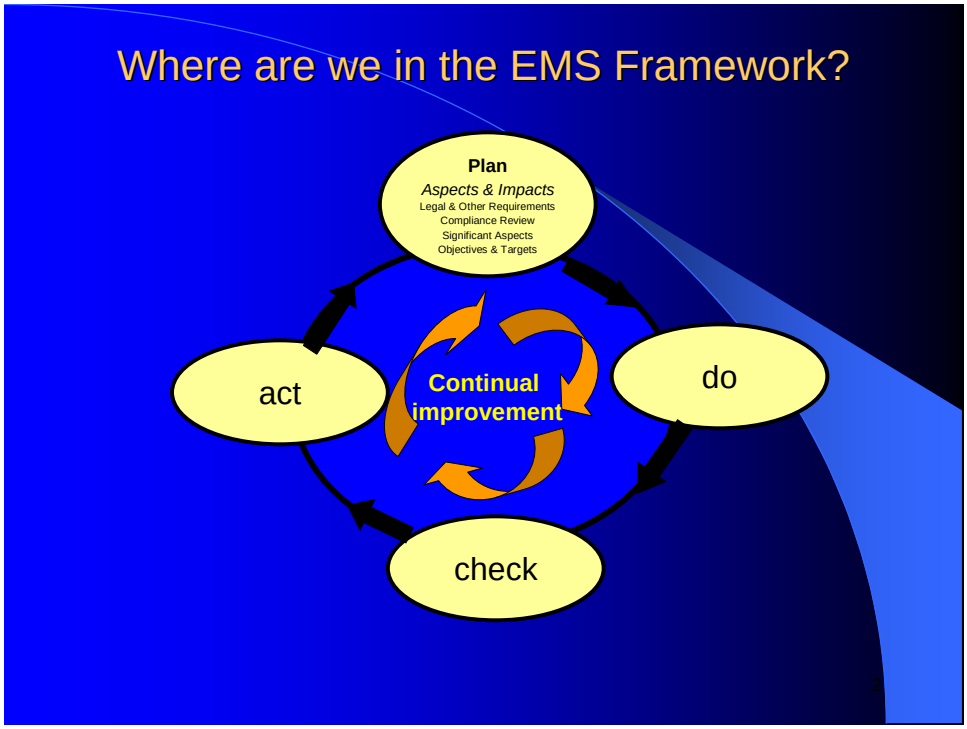
ASPECTS	IMPACTS
Emissions	Contaminates air (smoke, fumes, dust, odor, VOCs)
Dust	Contaminates water (storm, sanitary, groundwater)
Energy Usage	Contaminates land (soil, landfill)
Exposure to Workers/Public	Community impacts (noise, dust, visual)
Fire/Explosion	Cost
Leak/Spill	Human health risk
Noise	Over compliance limits (air, sanitary sewer, etc.)
Radiation	Unsafe working conditions
Recycling	Natural resource depletion (raw materials, water,
Use of Natural Resources	Natural gas, fuel oil , coal, diesel, electricity)

(See the associated Aspect/Impact Significance Determination Worksheet on page II-46.

ADDITIONAL EXAMPLES OF PROCEDURES

See http://www.ehs.wsu.edu/esrp490/environmentalaspects.htm for an example of a procedure documenting an how environmental aspects are developed. For a visual approach, see: http://www.orcbs.msu.edu/environ/programs_guidelines/ems/procedures/MSU%20EMS%20Apects....pdf

TIME TO PAUSE AND CHECK IN



The above figure shows where 'Aspects and Impacts' fits in the management system cycle. 'Legal and Other Requirements' are discussed next.

BEFORE MOVING FORWARD ONTO THE NEXT SECTION, ASK YOURSELF:

- ☐ ***List of Aspects and Impacts:*** Have we developed a final list of aspects and impacts that the Team feels is good enough to proceed?
- ☐ ***Documentation:*** Do we have a written procedure that documents how this list was developed?

WHAT'S NEXT?

1. Continue forward to (a) identify what regulations and other requirements apply to your college or university (Legal and Other Requirements) and (b) assess the status of compliance (Compliance Review).
2. Decide what you should focus on first (Significance).

NOTE: If you are simply doing projects, you can use the list of aspects and impacts to inform what individual environmental performance and/or sustainability projects your college and university might want to pursue, preferably with specific goals (Objectives and Targets), action plans (Environmental Management Programs), SOPs and Training.

IDENTIFYING LEGAL AND OTHER REQUIREMENTS: WHAT DO WE NEED TO KNOW AND PAY ATTENTION TO IN ORDER TO BE IN COMPLIANCE?

Colleges and universities are facing an increasing amount of environmental regulatory requirements at the federal, state, and local level. These frequently involve waste (hazardous, infectious, solid and radioactive), wastewater, air emissions, and wetlands/habitat alterations, as well as requirements of any voluntary programs in which a campus may participate.

Quiz

Do you know what legal environmental requirements apply to your institution?

(a) Yes, and there is a system to keep us up to date on them
(b) No, but I know who does
(c) No, but I think I could find out who does
(d) No, and I don't know who would know

Are your operations in compliance?

(a) Yes
(b) More than 50% are
(c) Less than 50% are
(d) I have no idea

When do people usually become aware of the status of your institution's compliance?

(a) Regularly
(b) When we get inspected
(c) When we get a penalty or fine
(d) When it gets into the media

Add up the # of responses: (a)_____ x 4 pts=_____
(b)_____ x 3 pits=_____
(c) _____ x 2 pts=_____
(d) _____ x1 pt=_____
Total_____

Score: >

10-12: **Low risk** of non-compliance, penalties, bad publicity;
8-10: **Low risk** but could benefit from improvements
6-8: **Medium risk**; improvements needed;
3-5: **High risk** of non-compliance, penalties, bad publicity

Institutions in non-compliance face potential penalties and negative publicity, increased tension with communities, and harm to their reputation and values. In order to reduce the risk of being in non-compliance your institution needs to:

(1) know what legal and other requirements it is subject to

(2) the status of its environmental compliance

(3) develop systems to achieve and maintain compliance.

You can use the questions in the box to get a quick idea of where your campus stands in its commitment to compliance.

What is it? This step involves the identification of the local, state, and federal legal requirements that apply to your operations, activities and services. It also includes internal requirements unique to your institution. It addresses the following questions:

1. Who has information on what legal requirements must be followed?
2. Who is responsible for keeping this information up to date?
3. What is the list of requirements and voluntary programs?
4. How do people learn about and get trained so that they know what legal requirements apply to their work and what commitments the voluntary programs have?

Remember

An Environmental Policy should have commitments to continual improvement, pollution prevention, and compliance.

What purpose does it have? Knowing what your institution has to comply with is a basic step in attaining and maintaining compliance. Knowing your voluntary commitments helps you meet your goals.

What's in it? A list of regulatory requirements/commitments and a procedure to ensure that the list is kept up to date, communicated to those who need to know, and revised on a regular basis.

What does it make possible? This step has two purposes: (1) it serves as a foundation to assess and maintain compliance and (2) it helps you when setting priorities for what aspects/impacts your institution will work on first (See Significance Ranking, next section).

Why do we need a list of Legal and Other Requirements? Without a list that is maintained, communicated, and regularly updated, your institution runs the risk of being in non-compliance and/or always being in a reactive mode with respect to inspections, compliance, commitments and new requirements. Just becoming aware of applicable requirements is a major step in preventing non-compliance.

When should we develop it? You probably have this kind of information in different places, starting with the EH&S and Administration offices. It is recommended that the Team work on this step immediately after identifying Aspects and Impacts. However, work on this element can begin anywhere in the process[22]. You can also use these tools at any time, even if you are not embarking on an initiative or an EMS. If you are developing an EMS, you will need this information to help prioritize areas you want to focus on. Note: If your Team includes (and it should!) your EH&S Director or environmental professionals, the Team will be able to quickly identify what aspects are regulated so 'significance' ranking is not necessarily dependent upon the identification of legal and other requirements.

Why do we need a procedure? Having a list or multiple lists of legal and other requirements somewhere does not mean that the list is updated, communicated, or used to promote and maintain compliance. A procedure

[22] ISO 14001:2004 states you "shall establish, implement and maintain a procedure(s) (a) to identify and have access to the applicable legal requirements and other requirements to which the organization subscribes related to its environmental aspects, and (b) determine how these requirements apply to its environmental aspects." Deliverables include: list of legal and other requirements, systems procedure that identifies who is responsible, how it will be communicated and maintained, training needs and plans.

is needed to make it clear who is responsible for updates, where the information is kept, and how the information will be communicated.

STEPS TO IDENTIFY LEGAL & OTHER REQUIREMENTS[23]

1. Decide who needs to be involved in this process and what their responsibilities should be.
2. Identify and evaluate the existing process for identifying applicable legal and other requirements, and means of assessing your requirements and commitments. (See examples of legal requirements in the following table).
   a. Identify what sources of information you currently use to identify applicable legal and other requirements, and what methods are used to have access to legal and other requirements (e.g., on-site library, use of web sites, commercial services, etc.).
   b. Determine whether these sources are adequate and effective, and how often they are reviewed for possible changes.
   c. If the existing process is not adequate, identify additional means to adequately and effectively identify applicable legal and other requirements.

Take note

Regulatory compliance requirements include:

- Federal requirements
- State and local requirements
- Permit conditions

Examples of other environmental "requirements" that your institution may have signed up for:

- Talloires Declaration
- Association for Sustainability in Higher Education performance commitment(s)
- CERES
- Greenhouse Gas Reduction Commitments

3. Find out how information on legal and other requirements is communicated to people within the organization who need the information.
4. Identify who is responsible for analyzing new or modified legal requirements to determine how the program might be affected.
5. Decide how to keep information on legal and other requirements up-to-date and shared with the people who need it.
6. Write up what your requirements are, who is responsible, and how to keep it current.
7. Start to think about who will need to be trained to be more aware of the legal and other requirements that apply to their operations. It may also be helpful to visit MIT's 'Environmental Virtual Campus', at http://www.c2e2.org/evc/home.html[24].

[23] Adapted from *Environmental Management Systems: An Implementation Guide for Small and Medium-Sized Organizations*, NSF International, Ann Arbor, MI, January 2001.

8. Use this information to review your initial list of aspects and impacts and/or as the list is refined in the future.

Tips

This can feel like agony if you have never compiled this information together in one place before!

- Find a format that is simple yet comprehensive enough. (Most lists are organized by regulatory agency or statute rather than by operations. Many find it more useful to start with the operation and identify the requirements and reporting associated with them.)
- Make sure the right people are involved in developing the list.
- Take the time to really review the contents (eyes tend to glaze over these kinds of matrices).
- Keep at it.
- Most importantly, SHARE this information with others, particularly in the Administration. Most of them have no idea how many requirements there are and how much your safety, health and environment offices have to do. Use this as a way to better communicate what you do and what you need in order to keep your college or university in compliance.

[24] The site was developed to assist students, staff, and researchers with campus environmental management practices, including both regulatory compliance and non-regulatory "green" environmental practices. The site is organized around nine typical areas on a campus that are normally subject to environmental regulations. These featured areas include: a laboratory, a central hazardous waste storage area (for generators storing waste for less than ninety days), a power/heating plant, an auto and grounds maintenance area, a residential area, a food service area, a graphic arts/theatre department, drains and sewers, and a medical facility

COMMON FEDERAL ENVIRONMENTAL LAWS

The following are commonly applicable federal environmental laws. Note that many of these apply to multiple areas and activities common to many colleges and universities, including:

- Laboratories
- Power generation
- Janitorial services
- Wastewater treatment
- Art studios
- Fuels management
- Fleet operations
- Solid waste management
- Grounds maintenance
- Hazardous materials management
- New construction
- Outdoor recreation (e.g., stadiums, golf courses)
- Renovation/demolition
- Food services
- Building maintenance
- Water supply

Commonly Applicable Federal Environmental Laws	
See http://www.gpoaccess.gov/cfr/index.html **See EPA's list of common violations for colleges and universities for insight to potential areas for c/u compliance needs at http://www.epa.gov/region01/assistance/univ/vio.html** **State and local requirements may be more stringent**	
Law[25]	**Description[26]**
Clean Air Act (CAA) [40 CFR Parts 50-99]	Establishes ambient and source emission standards and permit requirements for conventional and hazardous air pollutants including point sources (such as boilers and fuels), coatings and refrigerants. Includes requirement for risk management planning. Ozone Deplete Chemicals (ODCs): Establishes reclamation, recovery, recycling, and disposal procedures of refrigerants from vehicle maintenance facilities and air conditioning units. Also establishes certification procedures for technicians and equipment.
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, also known as "Superfund") [40 CFR Parts 300-311]	Establishes a program for cleaning up contaminated waste sites and establishes liability for cleanup costs. Also, provides reporting requirements for releases of hazardous substances.
Clean Water Act (CWA) [40 CFR Parts 100-145, 220-232, 410-471]	Establishes ambient and point source effluent standards and permit requirements for water pollutants, including sources that discharge directly to a water body or to a public sewer system. Includes stormwater and pretreatment requirements.
Emergency Planning and Community	Establishes a program (also known as the "Toxic Release Inventory") to inform

[25] Note that a number of laws address potential for spills. Phase III: DO!, includes approaches to address emergency preparedness and response.

[26] Adapted from *Environmental Management Systems: An Implementation Guide for Small and Medium-sized Organizations,* NSF International, 2001

Commonly Applicable Federal Environmental Laws	
Right-To-Know Act (EPCRA) [40 CFR Parts 350-374]	the public about storage and releases of hazardous and toxic chemicals. Reporting requirements apply to companies that use, process or store specific chemicals over specified quantities.
Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) [40 CFR Parts 150-189]	Establishes a program for Federal review of, registration and control of pesticides.
Hazardous Materials Transportation Act (HMTA) [49 CFR Parts 100-180]	Establishes standards for the safe transportation of hazardous materials.
National Environmental Policy Act (NEPA) [40 CFR Part 6]	Establishes national environmental policies and goals.
Resource Conservation and Recovery Act (RCRA) and Solid Waste Disposal Act (SWDA) [40 CFR Parts 240-299]	Establishes regulations and permit requirements for hazardous and universal waste management. Also, creates standards for underground storage tanks that hold oil or hazardous substances. In general, facilities that manage mixed waste are subject to the RCRA Subtitle C (Hazardous Waste) requirements for hazardous waste in 40 CFR part 124 and parts 260-270 implemented by EPA, or to comparable regulations implemented by States or Territories that are authorized to implement RCRA mixed waste regulations.
Safe Drinking Water Act (SDWA) [40 CFR Part 141]	Sets minimum national standards for drinking water (applies to colleges and universities that operate their own Public Water System). Sets maximum contaminant levels for coliform bacteria and potential contaminants in drinking water. Requires that mechanisms be put in place to protect groundwater and that water supplies be periodically monitored.
Toxic Substance Control Act (TSCA) [40 CFR Part 700-766]	Requires manufacturers to submit reports from specified toxicity tests for EPA assessment and to identify new and existing substances that may pose a significant risk or injury to health or the environment because there is insufficient information to conclude that they do not pose a significant risk or injury. Includes requirements for addressing PCBs, asbestos and lead.
Occupational Safety and Health Act (OSHA) [29 CFR 1910]	Establishes employer and employee responsibilities for keeping the place of employment free from recognized hazards that are causing or are likely to cause death or serious physical harm and includes both chemical and pathogen management. Laboratory Chemical Health and Safety is at 29 CFR 1910.1450-Occupational exposure to hazardous chemicals and laboratories.
Public Health, Security and Bioterrorism Preparedness and Response Act of 2002 [42 FR Parts 72 and 73]	Establishes rules regarding possession, use, and transfer of select agents and toxins.
Nuclear Regulatory Commission (NRC) [10 CFR Part 20]	Establishes standards for protection against radiation.

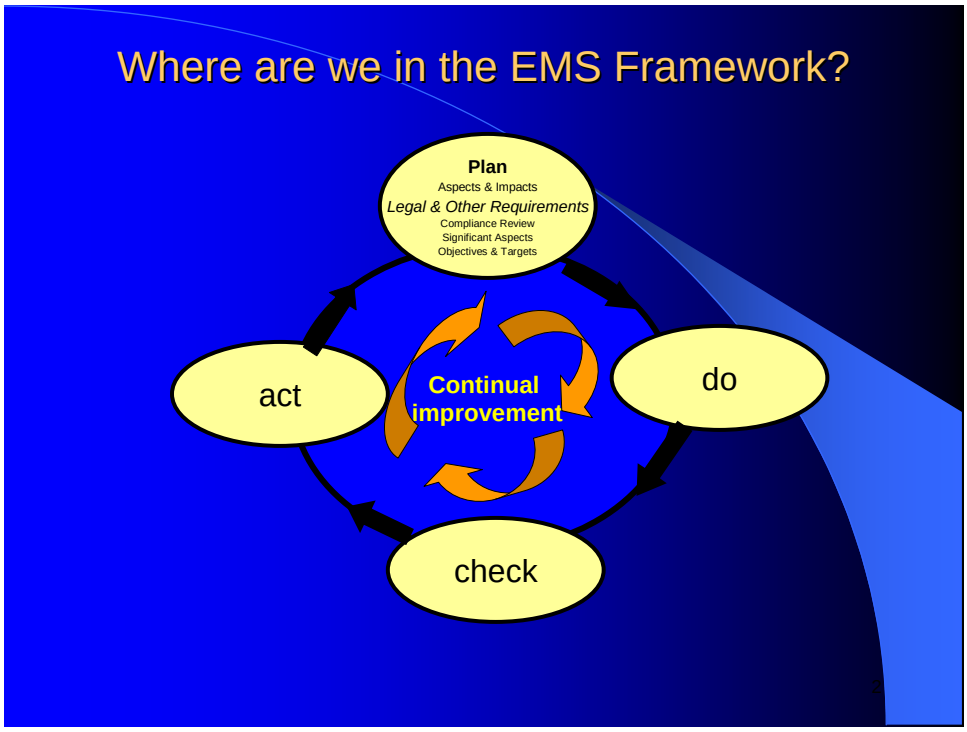
EXAMPLE OF A LIST OF LEGAL AND OTHER REQUIREMENTS

A sample list of legal and other requirements can be found at http://www.ehs.wsu.edu/esrp490/3-2Legal-OtherRequireMatrix.doc

EXAMPLE OF A PROCEDURE

An example of a procedure can be found at: http://www.ehs.wsu.edu/EMS/emslegal.asp

TIME TO PAUSE AND CHECK IN



The above figure shows where 'Legal and Other Requirements' fits in the management system cycle. Compliance Review (Are we in compliance?) is discussed next.

BEFORE MOVING FORWARD ONTO THE NEXT SECTION, ASK YOURSELF:

- ☐ ***List of Legal and Other Requirements:*** Have we developed a list that is comprehensive and user-friendly? Is it communicated and available? Do we know who is responsible?
- ☐ ***Documentation:*** Is there a written procedure that identifies who is responsible for maintaining and updating the list, where it will be kept (electronic and hard copies), and how often it will be updated and communicated.

OPTIONS FOR GOING FORWARD:

1. Continue forward to assess the status of compliance (Compliance Review).
2. Decide what you should focus on first (Significance).

If your college or university is only focusing on compliance, go to Compliance Review. If not, continue on.

COMPLIANCE REVIEW: ARE WE IN COMPLIANCE[27]?

In order to be in compliance with the laws and regulations that apply to your college or university and its operations, you must:

a. know what the regulations are,

b. know the compliance status of your operations or subset of operations, and

c. take actions and implement procedures and/or install or upgrade equipment to comply with those regulations.[28]

Your institution's compliance status should be addressed whether you are implementing an EMS, a sustainability initiative or simply continuing with existing projects and programs.

What is it? A compliance review is a periodic assessment of your college or university's compliance with environmental legal requirements. It can be developed in conjunction with the development of a list of Legal and Other Requirements.

What purpose does it have? Reviewing or auditing your compliance is an important process that helps you to meet your obligations, avoid fines and penalties, and preserve your institution's reputation and relations with your community. It also helps you to determine where there might be environmental problems on your campus and take corrective and preventive action(s) (For a list of commonly found issues, see http://www.epa.gov/region01/assistance/univ/comp.html).

What's in it? This step includes (1) assessing the legal requirements that apply to your institution (see previous section on Legal and Other Requirements); (2) auditing your compliance with those legal requirements; and (3) tracking your results and determining how to use them to get into and/or maintain compliance.

What does it make possible? The compliance review provides you with information to make sure that you are meeting your legal obligations and your commitment to compliance. It can support the development of good relations with federal, state and local regulatory programs. An institution's compliance status can also affect its ability to attract students and funding and improve its relations with the surrounding community. Implementation of an audit program also makes you eligible to participate in EPA's (and some states') voluntary disclosure program (see http://www.epa.gov/compliance/incentives/auditing/auditpolicy.html).

Why do we need a Compliance Review? Compliance is a critical issue for any institution. It sets the foundation for future efforts and provides staff with the feedback on how they are meeting their responsibilities.

[27] EPA has created online Compliance Assistance Centers and begun one for the college and university sector.

[28] While EMSs include auditing, corrective and preventive action as part of the 'Check and Act' part of the cycle, we have included this Compliance Review in the planning section so that colleges and universities can get an early handle on their compliance status. Such a review logically follows a review of legal and other requirements and past non-compliance actions against your institution. For added insight on following up on audits, please refer to the section on Corrective and Preventive action (page IV-12).

When should we develop it? Compliance reviews can be implemented independently of any other part of an institution's environmental or sustainability initiatives. Compliance should be viewed as a baseline upon which to build other environmental programs. It can also be developed in conjunction with the previous section as you build or confirm your knowledge of your legal and other requirements.

Why do we need a procedure? A procedure documents how you are determining your compliance status. It outlines who is responsible and how you intend to use your results. If you make use of a federal and/or self- audit disclosure program, you will need to certify that you have a system in place for periodically determining compliance. It also makes the decision-making transparent and repeatable in the future.

STEPS TO ASSESS CURRENT COMPLIANCE STATUS

1. Review your legal and other requirements along with any compliance issues your institution has had in the past.
2. Find out what, if any, actions have been taken to prevent similar issues from reoccurring.
3. Assess current compliance status (for any or all of the programs and areas you have identified in Step 1).
4. Identify or develop:
    a. Action plan(s) to get into compliance
    b. Compliance Calendar and tickler system
    c. Procedure to assess, report and communicate compliance status
5. Communicate findings and follow up.

TOOLS

To learn about past compliance issues at your institution and in your geographic area: query EPA's compliance database at http://www.epa.gov/echo/ or enviro-facts at http://www.epa.gov/enviro/ as well as your state environmental agency databases. Speak with your institution's safety, health and environmental professionals and legal counsel. Talk to your colleagues at other colleges and universities in the area to learn about their experiences.

To assess current compliance status: see Common Deficiencies with College and University Compliance Programs, page II-32, or http://www.epa.gov/region01/assistance/univ/vio.html. (This is a summary of areas in which EPA often discovers insufficient documentation or non-compliance with regulations.)

To complete a Self-Audit: Use or adapt checklists developed by others.[29]

[29] *E.g.*,

To develop a plan to get into compliance: Use Corrective and Preventive Action forms (page II-40).

To reduce the risk of getting into non-compliance: Develop a Compliance Calendar (page II-34). The compliance calendar is a blank form for organizing compliance requirements according to the frequency of completing reporting requirements. Your college or university can use the compliance calendar to manage your resources and the reporting obligations you have on daily, weekly, monthly, or annual basis, or on a specific date.

See a Procedure (page II-39) that describes the process for identifying and maintaining your institution's regulatory compliance approach. Because colleges and universities across the country and even within the same state have widely varying compliance requirements that are often dictated at the state or local level (for example, RCRA authorized states that add additional hazardous wastes requirements), the tools included in this element focus on helping your institution address common deficiencies.

Tip

Affirm good behavior! If a self-audit or checklist shows good efforts to comply, even if the results are not perfect, affirm and recognize this behavior. People need to be recognized for trying.

Traps to avoid

Applying Band-aid fixes to compliance issues without identifying root causes: Look for root causes so that problems don't re-occur.

Not articulating the resources that are needed to get into compliance: Articulate what is needed and when.

- Kansas State University's *Checklist for Campus Compliance Success* (this includes citations to Kansas statutes but is still useful outside Kansas) http://www.p2pays.org/ref/32/31698.pdf
- *The Environmental Self-Audit for Campus-Based Organizations* by the New York State Department of Environmental Conservations http://www.dec.ny.gov/docs/permits_ej_operations_pdf/ecppcamp.pdf .
- *Laboratory Safety and Environmental Management Self Inspection Checklist* by Rutgers University http://rehs.rutgers.edu/pdf_files/pisichk.pdf
- *Environmental Management Guide for Small Laboratories*, EPA, May 2000. http://www.epa.gov/sbo/pdfs/smalllabguide_500.pdf
- Various checklists at http://www.epa.gov/region01/assistance/univ/check.html. [In depth audit protocols are available at http://cfpub.epa.gov/compliance/resources/policies/incentives/auditing/ (note that the protocols on this site are not sector-specific and may feel overwhelming).]

COMMON DEFICIENCIES WITH COMPLIANCE PROGRAMS IN COLLEGES AND UNIVERSITIES

The following list includes common deficiencies EPA encounters in enforcing federal regulations at colleges and universities. (Also see a list of most common violations found by EPA Region 1: http://www.epa.gov/region1/assistance/univ/vio.html.) The list below includes only the most common violations and is intended to spur review of your institution's status and not act as a comprehensive checklist.

Regulation	Description[30]
RCRA areas of noncompliance	Appropriate labeling and marking of satellite accumulation containers. Marking and dating the period of accumulation for each accumulation container. Providing and documenting initial hazardous waste training. Separating or protecting containers of hazardous waste from other containers storing incompatible materials or wastes. Making hazardous waste determinations. Container Management – Closing containers that are accumulating hazardous waste (closed except when adding or removing waste). Obtaining a permit when storing hazardous wastes for greater than 90 days. Inspecting hazardous waste containers, specifically to inspect on a weekly basis. Having an adequate Contingency Plan for new operations. Providing secondary containment around hazardous waste container storage areas in an area with a functional floor drain. Maintaining and operating the facility in a manner to minimize the possibility of any planned or unplanned release of hazardous constituents to air, soil, or surface water which could threaten human health or the environment. Maintaining adequate aisle space to allow the unobstructed movement of personnel or emergency equipment in the container storage areas.
SPCC areas of noncompliance	Lack of SPCC plan. Preparation and implementation SPCC plan, specifically failure to include all elements of a complete plan as required by SPCC regulations. Plan not PE certified. Plan not reviewed/updated every three years.

[30] Note that a number of issues of noncompliance under more than one regulation include the failure to address potential for spills either because of a lack of planning, insufficient plans, or monitoring for spills. Phase III: DO!, includes approaches to help you to control operations as well as emergency preparedness and response.

Regulation	Description[30]
	Plan not including all oil on facility, i.e., transformers, hydraulic systems, emergency generators, drum storage, etc. Plan not accurately identifying, from each oil storage location, the detailed path spilled oil would take to reach a waterway, i.e., a typical campus is so wide, drainage may flow in different directions, to different receptors, especially in urban locations. Drains not traced out. Designated staff not conducting regular walk-through inspections of teaching and research locations to be aware of oil use by professors, TAs, graduate students, and other non-maintenance staff. Small, scattered Aboveground Storage Tanks (ASTs), especially in dormitory locations, not adequately protected from tampering/vandalism. A transient student population presents unique hazards not encountered with supervised adults in an industrial setting. Students are not employees, are not OSHA trained, and have no stake in paycheck protection through preservation of an employer's image or goodwill.
CAA areas of non-compliance	Submittal of appropriate reports. Monitoring fuel for nitrogen and sulfur content. Obtaining minor permits. Installing or maintaining opacity monitors in good working order. Exceeding annual or 12 month rolling cap for fuel or steam production. Providing and documenting actual annual VOC emission calculations for solvent degreasers (also involves records of solvent additions and deletions from degreasers). If there is a gasoline pump on site: keeping monthly throughput records. install/testing vapor recovery system; and keeping records of maintenance and malfunctions of vapor recovery systems. If there is a paint booth, using paint booth coatings that exceeded allowable limits of VOC contents. Obtaining permits and keeping records of operating hours for emergency generators.
Underground Storage Tanks	Gasoline tank Leak detection system not working properly. Tanks having no leak detection system. Incomplete tank removal – proper backfilling of hole; contaminated soil on site.

SAMPLE COMPLIANCE CALENDAR

WEEKLY

Area	Program	Program/ Question	Scheduled Task/Report

MONTHLY

Area	Program	Program/ Question	Scheduled Task

QUARTERLY

Area	Program	Program/ Question	Scheduled Task

ANNUALLY

Area	Program	Program/ Question	Scheduled Task

PERIODICALLY

Date	Area	Program	Program/ Question	Scheduled Task

EXAMPLE OF COMPLETED COMPLIANCE CALENDAR

WEEKLY

Agency	Program	Scheduled Task
State/Local	On-site Hazardous Waste Management	Facility Inspection -- check containment, stored containers, and tanks

WEEKLY

Area	Program	Scheduled Task
Chemistry Laboratories	State/Local On-site Hazardous Waste Management	Facility Inspection -- check containment, stored containers, and tanks

MONTHLY

Agency	Program	Scheduled Task
State/Local	Storm Water Pollution Prevention	Facility Inspection – conduct storm water discharge visual observation – check for presence of floating and suspended material, oil and grease, discoloration, turbidity, odor, and pollutants
POTW	Industrial Wastewater Discharge	Periodic Sampling
State/Local	Fuel Storage and Management	Tank, dispensing equipment inspections

MONTHLY

Area	Program	Scheduled Task
Loading Docks Admin Chem Dept. Food Services	State/local Storm Water Pollution Prevention	Facility Inspection – conduct storm water discharge visual observation – check for presence of floating and suspended material, oil and grease, discoloration, turbidity, odor, and pollutants
Chemistry Building basement	POTW Industrial Wastewater Discharge	Periodic Sampling
Maintenance Garage	State/Local Fuel Storage and Management	Tank, dispensing equipment inspections

QUARTERLY

Area	Program	Scheduled Task
Loading docks (List…)	State/Local Storm Water Pollution Prevention	Facility Inspection – conduct non-storm water discharge visual observation – check for flow, debris, odor, and discoloration
Pretreatment (List…)	POTW Industrial Wastewater Discharge	Periodic Report of Continued Compliance – submit quarterly discharge monitoring report to local sewer agency.

QUARTERLY

Agency	Program	Scheduled Task
State/Local	Storm Water Pollution Prevention	Facility Inspection – conduct non-storm water discharge visual observation – check for flow, debris, odor, and discoloration
POTW	Industrial Wastewater Discharge	Periodic Report of Continued Compliance – submit quarterly discharge monitoring report to local sewer agency.

ANNUALLY

Agency	Program	Scheduled Task
POTW	Industrial Wastewater Discharge	Industrial Discharge Permit – submit annual update (Note: update schedule may differ)
State/Local	On-site Hazardous Waste Management	Facility Inspection – check storage tank system
State/Local	Hazardous Materials	Submit annual update of Hazardous Materials Plan to local or state agency.
USEPA State/Local	Employee Training	Emergency Coordinator Training – annual refresher training
USEPA	RCRA	Annual Refresher Training
	TRI	Annual Toxic Release Inventory Reporting

ANNUALLY

Area	Program	Scheduled Task
Chemistry Dept. Art Dept. Etc. (List…)	POTW Industrial Wastewater Discharge	Industrial Discharge Permit – submit annual update (Note: update schedule may differ)
Generator 90-day	State/Local On-site Hazardous Waste	Facility Inspection – check storage tank system

storage area	Management	
EHS Office – report	State/Local Hazardous Materials	Submit annual update of Hazardous Materials Plan to local or state agency.
(List areas needing training…)	USEPA/State/Local Employee Training	Emergency Coordinator Training – annual refresher training
[E.g., Chemistry]	USEPA /state RCRA	Annual Refresher Training
	USEPA /state TRI	Annual Toxic Release Inventory Reporting

VARIOUS SCHEDULES:

Date	Area	Agency Program	Scheduled Task
March 1 of Even Number Years	EHS Office Manifest Folders	USEPA /State/Local On-site Hazardous Waste Management	Biennial Report – submit completed report on agency forms, if required
June 1	(List areas needing inspections)	State/Local Storm Water Pollution Prevention	Facility Inspection & Plan Review – conduct annual inspection of storm water structures and evaluation of SWPP Plan
Every 3 years	EHS PE	USEPA/State SPCC	SPCC Recertification and updating
Every 90 days	(List areas to be checked…)	USEPA/State/Local Hazardous Waste Management	Dispose of any hazardous waste before 90-day limit

VARIOUS SCHEDULES:

Date	Agency	Program	Scheduled Task
March 1 of Even Number Years	USEPA State/Local	On-site Hazardous Waste Management	Biennial Report – submit completed report on agency forms, if required
June 1	State/Local	Storm Water Pollution Prevention	Facility Inspection & Plan Review – conduct annual inspection of storm water structures and evaluation of SWPP Plan
Every 3 years	USEPA/ State	SPCC	SPCC Recertification and updating
Every 90 days	USEPA/ State/Local	Hazardous Waste Management	Dispose of any hazardous waste before 90-day limit

SAMPLE PROCEDURE

[College/University Name]	EMS Procedure	2.2
	Effective Date	
	Subject	Compliance

Purpose This procedure is used to (1) ensure [college/university name] compliance with environmental legal requirements, (2) identify [college/university name] current compliance status and performance, and (3) and help [college/university name] become informed about and track compliance requirements.

Step 1 The EMS Manager will complete a structured regulatory compliance review of [college/university name] operations. The EMS Manager will select other EMS participants and outside parties as appropriate to assist in the review. Generally, the compliance review will initially occur as a paper exercise conducted in the office and migrate to physical inspections and document review with individuals able to confirm and document the presence of appropriate compliance programs.

Step 2 After completing the compliance review, the EMS manager will track corrective and preventive action and will prepare a list of potential objectives and targets related to compliance requirements or performance. The list will be used in completing Element 2.3, Objectives and Targets.

Step 3 The EMS manager will reference the results of the compliance review during day-to-day operations to assist in planning for and meeting the [college/university name] compliance requirements.

Step 4 The EMS manager will stay informed of changing environmental regulations by [include those that apply to the program you develop]:

- Reviewing regulatory updates and our [college/university name] compliance calendar
- Attending compliance workshops offered by federal, state, and local regulatory agencies and sector associations.
- Using a consultant specializing in compliance issues
- Visiting Internet websites with compliance assistance content
- [Other]

Step 5 The EMS manger or designee will communicate the environmental regulations and the results of periodic compliance reviews to appropriate persons at appropriate levels at [college/university name].

Step 6 The EMS manger or designee will periodically complete a compliance review to identify new and existing weaknesses, and in response to new or changed environmental regulations.

CORRECTIVE AND PREVENTATIVE ACTION FOR COMPLIANCE FORM

NONCOMPLIANCE OR POTENTIAL NONCOMPLIANCE

Problem Identified: _____ Resolution Due Date: ___

Problem Identified By: ____

PROBLEM (DESCRIBE EXISTING OR ANTICIPATED PROBLEM):

MOST LIKELY CAUSE(S):

POSSIBLE SOLUTION(S):

Due Date:

Completed:

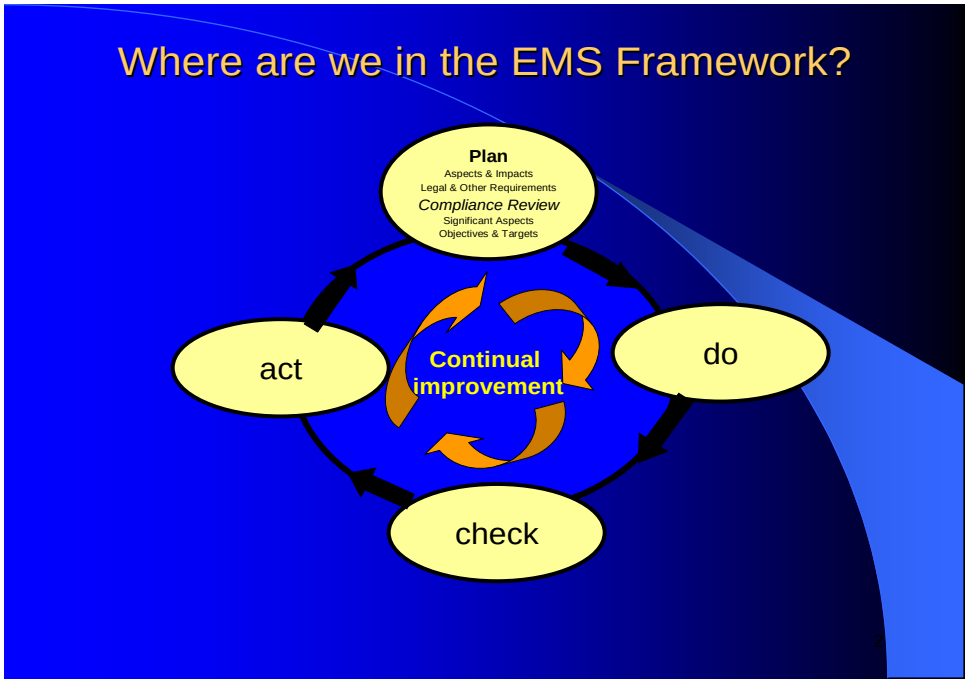
IMPLEMENTED SOLUTION(S):

Due Date:

Completed:

RESOLUTION (CONFIRM EFFECTIVENESS OF IMPLEMENTED SOLUTIONS):

TIME TO PAUSE AND CHECK IN



The above figure shows where 'Compliance Review' fits in the management system cycle. Significant Aspects (What do we work on first?) is discussed next.

BEFORE MOVING FORWARD, ASK YOURSELF:

- ☐ ***Compliance Review:*** Have we completed a review and communicated the findings? If non-compliance issues were found, do we have a plan to get into compliance? If none or few issues were identified, are we going to recognize and affirm good behavior and practices?
- ☐ ***Documentation:*** Do we have a written procedure that documents how often future compliance reviews will be taken, who will do them, and how the results will be used?

WHAT'S NEXT?

1. Use your compliance review to inform decision-making in your institution (e.g., capital improvements, personnel, budgets).
2. If the review revealed non-compliance issues, develop a schedule and plan to return to compliance, resource needs, training needs, and future audits. Note that Significance criteria in the next section can also be used to identify priorities to address non-compliance issues.
3. Continue forward to develop a list of significant aspects and impacts.

SIGNIFICANT ASPECTS: HOW DO WE DECIDE WHAT TO WORK ON?

Once your college or university's environmental aspects and impacts (or opportunities for pollution prevention and sustainability projects) and legal and "other" requirements have been identified, now what? While you must maintain compliance, you can't work on everything. You have to set priorities around the "other" requirements. 'Significance ranking' is an important step to help decide where to focus your efforts.

What is it? 'Significance ranking' is a valuable tool to help prioritize which aspects you will work on first. It is a crucial step in the EMS process and is an extremely useful tool to help set priorities for sustainability and/or other kinds of projects.

What purpose does it have? Ranking helps sort out which aspects or issues you should focus on first and which ones can either 'wait' for awhile or continue to be managed as they are without extra attention or intervention.

What's in it? This step includes (1) development of criteria by which you will evaluate each aspect or issue; (2) ranking of all aspects or issues; and (3) a determination of which are 'significant' and therefore need to be addressed and managed first.

What does it make possible? The criteria you use to determine significance will act as a filter to identify those aspects that your college or university will need to manage. After all aspects are ranked, a few will be determined to be 'significant'. These significant aspects will then be 'managed'[31] - objectives and targets will be set for them, action plans will be developed and implemented, and progress will be measured.

If you are looking at compliance issues, ranking these issues with 'significance criteria' helps you decide which ones you might want to evaluate more closely (particularly to see if you can substitute operations or materials to ones that are not regulated). If you are looking at possible efforts to promote sustainability, ranking these issues with 'significance criteria' helps you decide which initiatives you want to manage first.

Why do we need it? If you ask ten individuals to look at a list of environmental aspects and say which one is the most important, you will probably get ten different answers. Each person develops their own answers using a variety of factors in their heads (e.g., How bad is it? How easy will it be to address? How much money will it cost or save?). There are a lot of different ways to determine 'significance'. Articulating and using agreed-upon criteria to rank for significance will make decision-making more transparent. Without a process to determine which aspects should be addressed first, teams usually end up arguing and/or choosing by 'gut feelings' the pet projects of one or two vocal individuals.

When should we develop it? Significance criteria should be established during or after the development of Aspects and Impacts. Once a list of Aspects and Impacts is completed, your Team should rank the

[31] *Note*: If you are considering ISO certification, all aspects that you determine to be 'significant' MUST be managed. This means that Environmental Management Programs, procedures, operational controls, etc. will be needed for all of your 'significant' aspects.

aspects with the significance criteria to develop a short list of 'significant' aspects that should be considered for actions.

Why do we need a procedure? A procedure documents the definition and use of criteria as well as how they were used in ranking (e.g., above what score an aspect was deemed to be 'significant'). It makes the decision-making transparent and repeatable in the future. It also helps you to determine if you are being consistent.

Remember:

If you determine that an environmental aspect is 'significant' in an ISO 14001 EMS, it must then be managed under that EMS. It is better to start out with fewer and get the process and documentation down instead of being overwhelmed by a huge number of aspects or issues. Some advocate a goal of identifying 20% or the aspects that account for 80% of the actual or potential impacts.

APPROACHES

There is no one list of criteria to use in ranking your environmental aspects, compliance issues, or sustainability efforts. The Team develops its own list and approach. The following are two approaches to consider:

APPROACH #1: Ranking using criteria: In this approach, criteria are developed, all environmental aspects are ranked, and a threshold number is identified (over which an aspect will be considered 'significant'. See worksheets that follow, page II-46).

Tips

- Look at several guides and examples
- Use the Team to develop a short list of criteria
- Keep it simple but understandable
- Document the criteria and process as you develop it

Typical criteria[32] include:

- Regulatory Compliance Requirements
- Likelihood of Environmental Impact
- Frequency of Environmental Impact
- Environmental Consequence/Severity
- Business Cost of Impact
- Cost or Level of Effort to Reduce Negative Impact
- Potential for Fine or Penalty
- Potential for Harm to Public Image

[32] See a summary of criteria used by different organizations on page II- 51.

- Human Health Consequence /Severity
- Feasibility to address and manage

APPROACH #2: Threshold Criteria: In this approach, the impact is evaluated against the significance value of the appropriate attribute.

EXAMPLE[33]:

Attribute	Significance Value
Solid wastes	Any stream greater than 5 tons per year or that can be profitably recycled.
Energy Use	Any specific use that costs $____ or more per month (or total usage if greater than $____ per month).
Water usage	Any use over 5,000 gallons or total use over 25,000 gallons per week.

Remember that the approach you use is up to you.

Traps to avoid:

Having too many criteria: Keep it around 5-8 (see examples and choose or modify what works for your team).

Creating complicated weighting schemes: Many teams get caught up in weighting/multiplying schemes and multiplication factors. Keep it simple!

Having too many 'significant' environmental aspects: Remember that no one is imposing a definition of significance—the Team develops this. Many teams set the 'significance' threshold too low and they end up with too many aspects the first time around.

Thinking that "if something isn't "significant", it means that we don't work on it": While 'significant' aspects require additional intervention and attention to manage them, other issues can still be important and can be addressed or may be being handled 'well enough for now'.

[33] Adapted from *An Environmental Management System Troubleshooter's Guide for Local Governments.* Global Environment and Technology Foundation, p.29. http://www.peercenter.net/sector/generalresources/more.cfm?frontid=2210

TOOLS

The following worksheets can be used to rank your aspects (also note example procedure on page II-18).

STEPS TO SETTING SIGNIFICANCE

Step 1: Modify the worksheets to fit the criteria you have developed for the aspects and impacts that you identified at the beginning of this phase.

Step 2: Have the Team score each aspect and impact for each criterion you've chosen.

Step 3: Add the scores of all criteria for each aspect and write the total in the right-most column of the form. This number indicates the relative priority of the aspect compared to other aspects and impacts in the same category. The higher the total score, the higher the priority.

Step 4: Decide what number above which an aspect will be considered 'significant'. (Remember: when you have chosen how you want to define what is significant under an EMS and per ISO 14001, if you have identified an aspect as being 'significant', you must address/manage it (e.g., through an Environmental Management Program, Phase III)).

Step 5: Use the prioritized list of aspects when setting Objectives and Targets (see page II-54).

ENVIRONMENTAL ASPECTS AND IMPACTS RANKING

WORKSHEET 1

For each aspect and impact, score each prioritization criterion on a scale from 1 to 5. For impact criteria, 5 indicates the criterion is very important or relevant to that aspect (for example, the aspect is strictly regulated, is the subject of compliance violations, or highly hazardous), and 1 indicates the criterion is relatively unimportant.

		Prioritization									
		0=Not applicable 1=Low 2=Low/Moderate 3=Moderate 4=Moderate/High 5= High								Cost 1=High 5=Low	
Activity/ Product/ Service	**Environmental Aspect/ Impact**	**Regulatory / Legal Concerns**	**Environmental Consequence**	**Health & Safety consequence**	**Likelihood of occurrence**	**Frequency of occurrence**	**Potential for harm to Public Image**	**Ease of Implementation**	**Potential to reduce or avoid costs**	**Cost of implementation**	**Score (Sum of scores)**
1.											
2.											
3.											
4.											
5.											
6.											

Add Continuation Sheets as needed to Rank All Aspects.

NOTE: Many use 'volume' and 'toxicity' as criteria, particularly in ranking waste streams.

WORKSHEET 2

A Simple Matrix Approach in which everything that is regulated is significant yet the numerical ranking reflects gradations in significance.

Aspect	**Regulated**	**Volume**	**Toxicity**	**Health Impact**	**Nuisance**	**Cost**	**Total**	**Significant?** *(aspect considered significant if score is > 12)*

KEY: 5 = High 3 = Medium 1 = Low 0 = Not applicable

Cornell University's Aspect/Impact Significance Determination

Cornell University Utilities Department			Enviro. or Other Req?	Significance				Priority Ranking
				Severity of Potential Impact	Likelihood of Potential Impact	Opportunity to Control	Frequency of Activity	
Activity	**Aspect**	**Impact**	**Yes/No**	**A** **5-High** **3-Medium** **1-Low**	**B** **5-Very Likely** **3-Somewhat** **1-Not Very**	**C** **5-High** **3-Medium** **1-Low** **0-None**	**D** **5-Hourly/Daily** **4-Weekly** **3-Monthly** **2-Qrtly/Semi** **1-Annually**	**[AxBxC]+D**

Criteria	Ranking
Organization A used these criteria o Worker Health & Safety o Public Health and Safety o Severity of environment o Probability of Occurrence o Regulatory & Legal Concern o Public Image	*0=Not Applicable* *1=Low* *2=Moderate* *3=High* *4=Very High* *5=Extremely High*
Organization B used these criteria o Frequency or likelihood of associated impact on: o Human Health o Environment o Resource Use	*Degree of impact:* *1=No impact; 2=Minor; 3=Moderate; 4=Serious* *Frequency/Likelihood of Impact: 1=Improbable; 2=Infrequent; 3=Frequent; 4=Continuous*
Organization C used these criteria o Environmental Impact o Volume/variety o Health o Cost o Regulatory Requirement o Toxicity o Nuisance o Probability	*1=Low* *5=High*
Organization D used these criteria o Natural Resources Impact o Cost o Probability of Occurrence o Volume o Toxicity o Regulated o Adverse Publicity o Nuisance o Human Health Impacts o Frequency	*1=Low* *5=High*

Criteria	Ranking
Organization E used these criteria o Regulatory: All regulated aspects o Human Health: Potential to cause adverse human health impact o Natural Resources: Potential to cause adverse impact to soil, ground water, surface, water, air or sediment o Costs: Greater than $5000 o Probability of Occurrence: Likelihood of greater than 1 instance of occurrence o Solid Wastes: Potential for recycling or significant reduction in generation o Public issues: Likelihood of media involvement	*1=Low* *5=High*
Organization F used these criteria with a weighted total (Likelihood of Occurrence and Magnitude of Impact each get a score of 1-3 (low, medium, high) which is then multiplied for a total Env. Impact rating). o Environmental impact rating: o Likelihood of Occurrence o Magnitude of Impact	*Regulated (0=Not regulated, 5=Regulated)* *Current Operational Cost (1: low, 2: medium, 3: high)* *Availability of Proven, Cost-Effective Environmental Improvements (1: low, 2: medium, 3: high)*
Organization G used these criteria o Regulated o Scale and severity o Natural resource conservation o Significant economic impact o Concerns of interested parties	*1=Low* *5=High*

In addition to the example below, see
http://www.orcbs.msu.edu/environ/programs_guidelines/ems/procedures/MSU%20EMS%20Apects....pdf.

	ENVIRONMENTAL MANAGEMENT SYSTEM Environmental Health & Safety University of Massachusetts Lowell 1 University Avenue Lowell. MA 01854	Created on ____ Page __of ___ Revision Draft # 0
DCN# UML-OLN-SYS-4.3.1-14100-4		Created by : Richard Lemoine
Document Title : significant aspects systems procedure		Approved by : System Admin

1.0 PURPOSE

To identify the significant environmental aspects and impacts of the Olney Science Building's activities, products, and services over which it can control or influence and that interact with the environment in a positive or negative manner. The procedure also describes the process used to identify the significant aspects that will be considered for setting objectives and targets.

2.0 SCOPE

This procedure covers all of the activities, products and services of the Olney Science Building. This procedure requires the analysis of operational details and regulatory standards in order to determine those that have or can have significant impacts on the environment.

3.0 DEFINITIONS

Environmental Aspects – are defined as those elements of the Olney Science Building's activities, products or services that can interact with the environment

Environmental Impact – any change to the environment, whether adverse or beneficial, wholly or partially resulting from the activities, products or services of the Olney Science Building.

Significant Environmental Aspect – an environmental aspect that has or can have a significant environmental impact

4.0 RESPONSIBILITY AND AUTHORITY

The Core Team is ultimately responsible for compiling the list of significant environmental aspects associated with the activities, products and services of the Olney Science Building. They shall review this information on an annual basis to keep it current.

5.0 PROCEDURE

5.1 The Core Team is ultimately responsible for the identification of environmental aspects and impacts and the determination of significance.

5.2 The Core Team is divided into two committees called Lab and Operational who are responsible for identifying a draft list of the significant aspects for their respective operational area.

5.3 Both Committees conduct a baseline analysis for aspect identification and will review the aspects on an annual basis to accommodate changes in operations or activities.

5.4 The Lab and Operational Committees review their respective aspects to identify any that may have applicable local, state or federal regulations.

5.5 Each committee reviews their respective aspects against the following significance criteria:

Environmental Impact	Regulatory Requirement*
Volume/Variety	Toxicity
Health	Nuisance
Cost	Probability

**Any aspect with an associated regulatory requirement shall be deemed a significant aspect by default.*

5.6 Each aspect is evaluated against each of the significant aspect criteria in section 5.5. Each committee member assigns the aspect a score against the criteria which is then added for a group total. The score of each criteria for a specific aspect is added for a total score.

5.7 The Committee uses the numerical ranking as a starting point for discussion to identify the significant aspects.

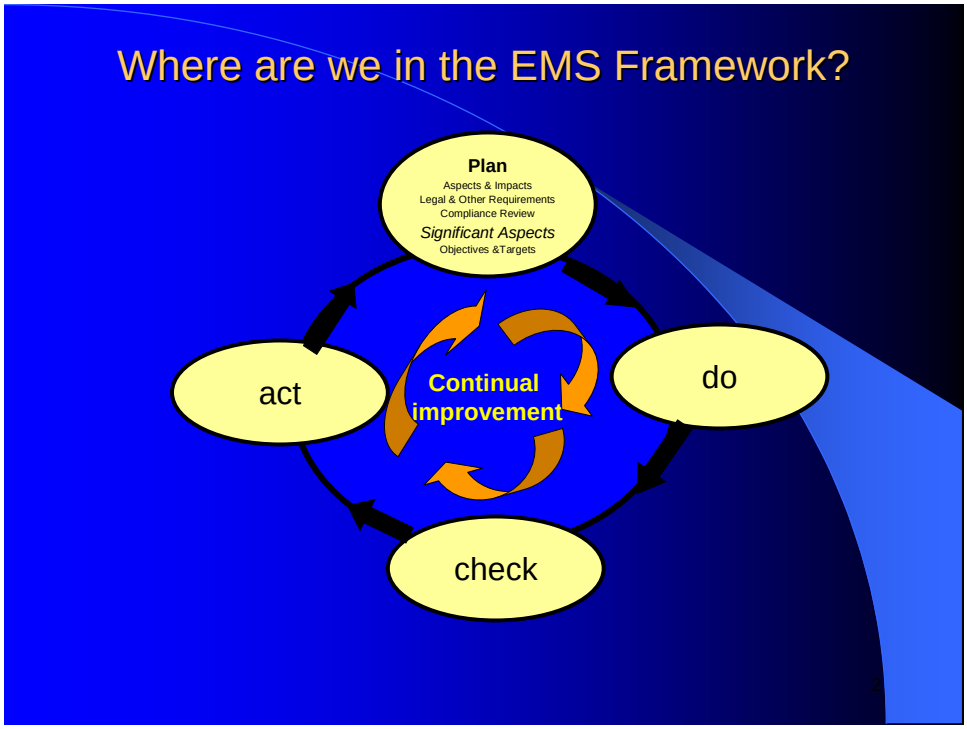
5.8 The Committees reconvene as the Core Team to discuss their findings as a group to determine the final list of significant aspects. The list of significant aspects shall be kept on record by the Environmental Management Representative.

5.9 The significant aspects shall be taken into consideration when setting objectives and targets.

6.0 RECORDS

6.1 Significant aspect list

TIME TO PAUSE AND CHECK IN



The above figure shows where 'Significant Aspects' fits in the management system cycle. Objectives and Targets (What do we want to accomplish and by when?) is discussed next.

BEFORE MOVING FORWARD, ASK YOURSELF:

- ☐ ***Significant Aspects:*** Do we have a list that indicates where we should focus our attention?
- ☐ ***Documentation:*** Do we have a written procedure that documents the criteria we used as well as the determination of 'significance'?

WHAT'S NEXT?

Take the 'significant' aspects and issues and set goals (Targets and Objectives) and develop ways to manage them to reach those goals (using Environmental Management Programs).

SETTING OBJECTIVES AND TARGETS: WHAT DO WE WANT TO ACCOMPLISH AND BY WHEN?

You have identified 'significant' or priority areas your college or university wants to work on. Now you have to decide what goals you want to set, the timeframe to achieve those goals, and how you will measure progress.

What are Objectives and Targets? Objectives and targets are clear expressions of what you are trying to accomplish to improve compliance, environmental performance and/or move towards sustainability. They are a key part of planning and managing any kind of project or initiative.

What purpose do they have? Setting objectives and targets is an articulation of where you want to be in the next one to five years. They represent the transition from planning to action and help you make your vision a reality. Put another way, without them all you have are ideas about what you want to do but no steps to get you there.

What's in objectives and targets? Simply put: Doing something by some amount by some date.

An objective is an overall goal, arising from the environmental or sustainability policy that a college or university sets itself to achieve.

Example: Reduce energy use.

Objectives and targets originate from:

- Environmental Policy
- Aspects and Impacts Review
- Compliance Review
- Results of Audits

A target is a quantifiable and measurable performance goal related to and supporting a specific objective. In other words, specific targets must be met for an objective to be achieved.

Example: Reduce energy consumption used by Building ____ by X% by Y Year.

Tip

Never underestimate the power of clear goals to motivate people: Even the most tired team can stay motivated if they believe in the goals and they see progress in making them a reality

What do they make possible? As tangible goals, objectives and targets are what drive strategies and actions. Many other elements, particularly measurement and monitoring activities, will be driven by the objectives and targets. For this reason, they should be carefully expressed and energetically communicated. In addition, endorsement from administration and input from faculty, students, and staff affected by the objective is critical in developing targets that are meaningful and practical. Reviewing the objectives and targets at regular intervals provides a good opportunity to gauge progress, cost savings, and improved environmental performance.

Why do we need them? Specific goals with dates and amounts motivate actions and the allocation of resources to achieve the goals. "Improving compliance" or "reducing the generation of hazardous waste" are fine overall goals but do not communicate how much or by when. A management system builds in accountability by identifying specific things to be achieved and then checking to see how well they worked so that continuous improvements may be made.

When should we develop objectives and targets? Identify specific goals after you have developed a list of significant environmental aspects or sustainability projects you want to address.

Why do we need a procedure? A procedure makes it clear how you went about developing your objectives and targets and how often they should be revisited.

Tips

Objectives reflect priority aspects and compliance issues.

Targets should be:

- Manageable: Number and complexity of objectives and targets should be kept at a level that you feel you can successfully manage (you can always add more later!)
- Linked to a source (of the waste or environmental aspect)
- Related to a baseline – preferably one that can be graphed over time to show progress
- Quantitative (i.e., measurable)
- Normalized (as much as possible, scaled to the level of activity)
- Meaningful to your institution

Traps to avoid

Setting a broad goal with no date or #s: Objectives and targets have to indicate what you're trying to accomplish, by what amount, and by when. If you are serious about improving compliance, performance, or sustainability, make your goals specific.

Thinking "We'll get information later": It is important to collect baseline information so that you can assess and communicate accomplishments later. Remember: the information may not be perfect: it should be good enough to use for its intended purpose and more importantly it should mean something to your Team and institution

Picking goals that are 'too safe' or 'too stretch': Many pick really 'safe' objectives and targets they know they have a good chance of meeting. The other extreme is to make them a so 'stretch' that they are not useful in motivating and tracking changes. Find something that works for you.

Worrying about not meeting goals: Many people are concerned that they may not be able to meet the goals. Remember: this is about continual improvement

How Targets can be Written for Maximum Effectiveness		
Poorly written	**Better**	**Best**
Increase paper recycling	Increase paper recycling by 15% in 2 years.	Increase paper recycling in the _____ Building by 15% as measured by (*volume or weight*) per capita (*students, faculty, staff*) in 2 years using baseline information that indicates _____.
Explanation		
Too general – no numbers or date to aim for	15% of what?	This includes: o a number o date o normalized measure o baseline to be able to compare.

See Cornell University's SHE Objectives & Targets on the next page for examples of objectives and targets and how an institution can summarize action plans and performance measurements with objectives and targets.

CORNELL UNIVERSITY	Cornell Management System for Safety, Health and the Environment	Single Point Lesson
Single Point Lesson Title **SHE Objectives & Targets**	Single Point Lesson Number CMS-SPL-001	Unit CMS

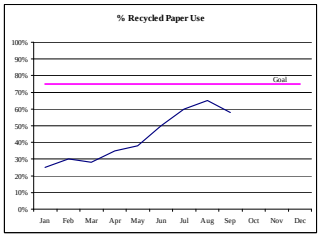
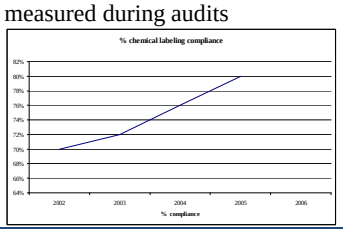
Why set objectives and targets?

- Improve performance over time
- Engage and motivate others to a specific outcome
- Reduce safety, health and environmental risk

WHAT SOURCES OF INFORMATION SHOULD I USE TO GENERATE IDEAS FOR OBJECTIVES & TARGETS?

- Leadership priorities
- Assessment of significant aspects and impacts
- Compliance audit results
- Gap assessment results
- Monitoring & measuring from past performance
- Brainstorming session on program or organization goals

EXAMPLES:

Objective:	Target:	Action Plan:	Performance Measurement:
Increase use of recycled content paper	To 75% by 2007	1. Communicate objective & target to organization 2. Replace all virgin paper stock with recycled content paper 3. Etc.	measure of current use of recycled content paper, measure % increase over baseline 
Increase chemical labeling	By 10% by 2007	1. Understand scope of current problem 2. Conduct why-why to determine root causes 3. Develop actions related to root cause 4. Etc.	% compliance for chemical labeling measured during audits 
Submit Title V renewal permit	By 8/2006 (on time)	1. Obtain application 2. Gather updated information 3. Populate application 4. Etc.	Progress versus action plan schedule

DEFINITIONS:

Objective: an overall safety, health, or environmental goal, arising from Cornell's policies, that an organization sets itself to achieve.

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

APPROACHES

There are two approaches you can take in developing objectives and targets. Decide what approach works best for your Team and institution.

APPROACH # 1: **'Forecasting' Approach:** The Team takes each significant aspect and projects out over 2 -5 years how much progress they think is possible, balancing the need for a 'stretch goal' with the reality of what the Team thinks can actually get done. Under this approach, the Team is trying to predict the near term future based on current conditions. Use the worksheet tool (page II-60) to try this approach.

Examples of OBJECTIVES AND TARGETS

Objective	Target
Reduce hazardous waste generation from chemistry labs	Decrease quarterly quantity of lab-pack hazardous waste by 15% by March 2008 compared to 2005 quarterly average
Purchase "greener" janitorial chemicals	Replace three high-use products with alternatives safer for the environment, employees, and students by January 2008
Conserve energy in nonresidential campus buildings	Decrease kWh use by 10% by January 2008 compared to 2000 same month use
Improve solid waste management	Increase recycling diversion rate to 50 percent (including food waste) by January 2008
Improve hazardous waste compliance	Add improved Hazardous Waste awareness module to initial and update training program for all employees and staff by January 2007 Implement new online interactive Hazardous Waste training for all employees and staff who generate or manage Hazardous Waste by June 2007 Increase laboratory audit scores by 20% by January 2007
Improve fuel storage compliance	Meet requirements of Underground Storage Tank Compliance Act by developing and using standardized forms/reports and master schedule for all compliance obligations relating to each of the 27 fuel storage facilities
Improve C/U's environmental standing and image with the local community	Produce and make available C/U Annual Environmental Report via website; promote at least four accomplishments during 2007 through local press releases

APPROACH #2: 'Backcasting': Under this approach, the Team is first envisioning a future condition and then plotting a path back from that vision to the present. The Backcasting technique helps a team to think beyond a one or two year time frame. It helps a group get beyond the "10% in two years" typical target. Steps include:

1. List activities associated with significant aspects on the left hand column (e.g., generation of waste).
2. Create a long term vision (e.g., what will solid waste look like and be managed on our campus 25 years from now?).
3. Envision sustainable endpoints for major activities (e.g., all waste will be recycled, purchasing procedures will minimize waste).
4. Determine specific steps from the sustainable endpoint to your current condition. (e.g., expand recycling programs by date, change purchasing operations in such a way by such a date).

See Backcasting worksheet (page II-61) to try this method.

Normalization, where appropriate, is the only true method to gauge progress toward targets because increases or decreases in activity can skew data collected under measurement and monitoring. For example, if water conservation is an objective and campus-wide water use is the parameter measured for the target, an increase in student enrollment might affect water use reduction efforts. Similarly, energy consumption will increase if new buildings are built (but keep in mind that many global energy use reduction efforts count off a baseline that is not normalized). Examples of normalization metrics that might be used at colleges and universities include:

- Student enrollment (campus-wide or in particular classes and labs)
- Pesticide Use: Acres of grounds landscaped
- HVAC Energy Use or Janitorial Chemical Use: Square feet of building space maintained
- Vehicle Maintenance: Number of vehicles or miles traveled

WORKSHEET TO DEVELOP OBJECTIVES AND TARGETS USING THE 'FORECASTING' APPROACH.

Summary of EMS Objectives and Targets			
Objective	**Target**	**Aspect Addressed**	**Measurable Parameters for Tracking Progress**

BACKCASTING WORKSHEET

Developed by Zero Waste Alliance, http://www.zerowaste.org

Activity	Vision (25 years)	15 years	5 years	Current Action

SAMPLE PROCEDURE – REVISE AS NEEDED

[College and University Name]	EMS Procedure	2.3
	Effective Date	
	Subject	Objectives and Targets

Purpose This procedure is used to (1) develop and update the EMS objectives and targets and (2) create action plans for achieving the objectives.

Step 1 The EMS Manager and EMS Participants are responsible for developing the EMS objectives and targets. Similar to the aspects and impacts review, the EMS Manager solicits input from [Name] departmental staff to ensure that objectives and targets are realistic and achievable.

Objectives are goals that are consistent with the organization's environmental policy, priority environmental aspects, and applicable environmental regulations.

Targets are detailed performance goals related to, and supporting a specific objective. Targets should be quantitative, realistic, linked to a source, measurable, and related to a baseline and normalization metric.

Step 2 Objectives and targets will be linked to significant environmental aspects and compliance issues identified by EMS Procedures 2.1 and 2.2, respectively.

Step 3 An action plan will be developed for each objective. Each action plan will describe specific actions needed to achieve the objective, the resources needed for each action, the person responsible for each action, and deadlines.

Step 4 Progress in achieving EMS objectives and targets will be tracked according to procedures described in Element 4.1, Measurement and Monitoring.

Step 5 On a monthly basis, the EMS Manager and other [Name] departmental and facility staff will (1) review objectives, (2) discuss the impact of corrective and preventive actions on objectives and targets, (3) determine whether existing objectives should be modified based on experience from the action plan and (4) develop new EMS objectives when existing objectives are met.

Step 6 Every 6 months, the EMS Manager will prepare a status report of progress against objectives and targets for the [Name] administration for review and input.

Step 7 Objective and target documentation will be retained for at least 2 years.

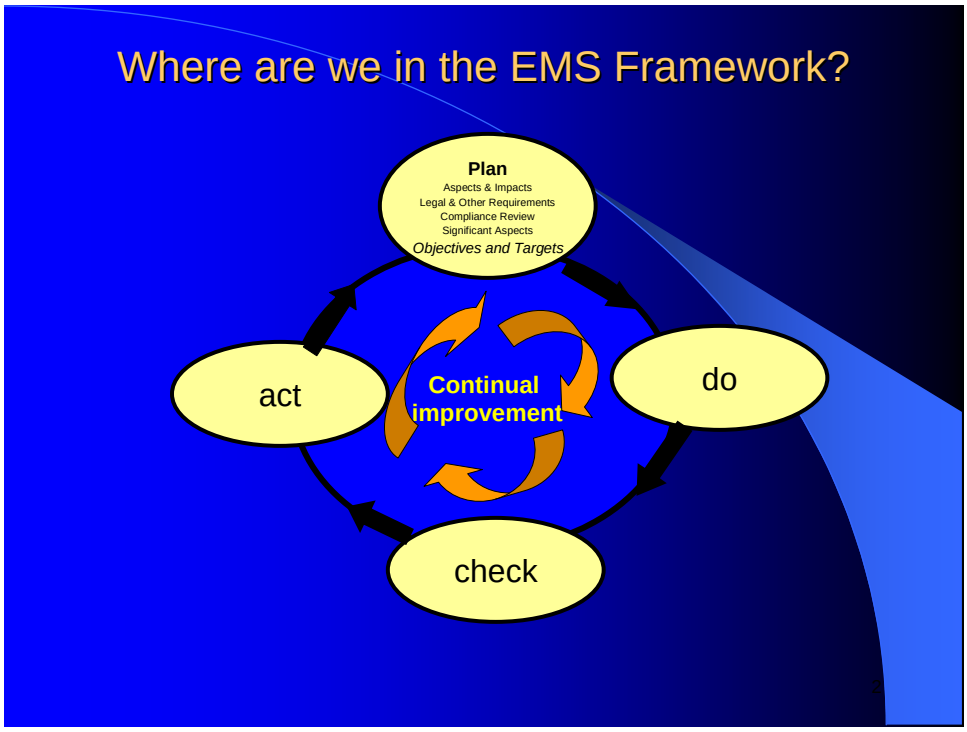
Records The EMS objectives and targets list

EXAMPLES OF PROCEDURES TO DEVELOP OBJECTIVES AND TARGETS

Examples of Procedures can be found at:

http://www.orcbs.msu.edu/environ/programs_guidelines/ems/procedures/MSU%20Environmental%20Objectives%20&%20Targets.pdf and http://www.ehs.wsu.edu/EMS/emstargets.asp

TIME TO PAUSE AND CHECK IN



The above figure shows where 'Objectives and Targets' fits in the management system cycle. 'Environmental Management Programs' (How are we going to meet our goals?) is discussed next.

BEFORE MOVING FORWARD, ASK YOURSELF:

- ☐ ***Objectives and Targets:*** Do we have a short list of objectives and targets that are meaningful to our institution? Do we have baseline data to use in measuring progress and results?
- ☐ ***Documentation:*** Do we have a written procedure that documents how objectives and targets were developed?

WHAT'S NEXT?

Continue on to develop Action Plans/Environmental Management Programs and associated elements in 'Phase III: DO!' as part of an EMS.

Before moving to 'Phase III; Do!', take a few minutes to see how far you've come and what challenges still exist. You can do this in several ways:

- Check in on the original project scope you developed in Phase I (refer to Phase I-13) to (a) see how you've done in accomplishing what you said you were going to; (b) see if any adjustments are needed to the timeline, milestones, and resource needs; and (c) keep the Team focused and motivated.
- Write down where you want the project, EMS, or Sustainability Initiative to be in 3 months.
- Work with your team to discuss: What's working well in how we are developing our project, EMS or Sustainability Initiative? What could be improved? Write down 3 things you will continue to do and 3 new things you will try.
- If you completed a Gap Analysis (Phase I-18), go back and complete questions 1-8 on the Gap Analysis to see what changes have occurred.
- Similarly, if you completed the C2E2 'crosswalk' (Phase I-24), go back and see how your score has changed.

PHASE III: DO!

You have identified what you want to work on, what you want to accomplish by when and how you will measure progress. How are you going to get it all accomplished?

Phase 3, "Do!" includes steps and tools that can be used to continue the development of an EMS but are equally useful in and applicable to a Sustainability Initiative or individual environmental or pollution prevention projects. This phase includes:

Action Plans, sometimes called Environmental Management Programs: How are we going to meet our goals? What steps need to be taken and by whom?

Building the Management System

Operational Controls (page III-19)**:** What parts of our operations do we need to focus on in order to meet our goals? How are we going to control our environmental risks?

Roles and Responsibilities (Page III-36)**:** Who's going to do this?

Communication (Page III-46)**:** How do we spread awareness and increase involvement?

Training (Page III-58)**:** Who needs to be trained to make it happen?

Controlling documents & managing records (Page III-71)**:** Are we keeping track of our efforts? Are we working with the right tools?

Emergency Preparedness & Response (Page III-87)**:** How do we prepare for and respond to potential emergencies?

ENVIRONMENTAL MANAGEMENT PROGRAMS: HOW ARE WE GOING TO MEET OUR GOALS?

Action Plans, sometimes referred to as Environmental Management Programs (EMPs), are the vehicle to accomplish your objectives and targets. They are the 'road maps' for achieving environmental and sustainability goals.[34]

What are they? They are reasonably detailed action plans that address "who, how, and when" each objective will be reached.

What purpose do they have? Because they identify specific steps, strategies, resource needs and responsibilities, they help you accomplish what you have set out to do. Action Plans/EMPs make the planning real and result in action.

[34] *Environmental Management Systems: An Implementation Guide for Small and Medium-Sized Organizations*, NSF International, Ann Arbor, MI, January 2001. p 32.

What's in one? An Action Plan/EMP is a basic project management tool similar to those you have probably used in developing and implementing projects or initiatives before. They might be referred to as scopes of work, action plans or project management plans but they all have the following basic elements:

- What you are trying to accomplish and by when
- What strategies and action steps need to be taken
- Who is going to take them
- What is needed to make the actions possible
- How to measure success
- When you will check in to see how things are going and if you need to adjust

What do they make possible and why do we need them? Simply stating objectives and targets seldom initiates action. Action Plans/EMPs guide actions and decisions. They are also learning tools—it may turn out that the strategies and actions first recommended do not work or work as well as originally had been hoped.

When should we develop them? Develop your plans after identifying objectives and targets. Note that it may be possible and preferable to establish operational controls and measurements concurrently.

STEPS TO DEVELOP ACTION PLANS/EMPS

1. Get practice developing an Action Plan/EMP (use the simple 'pizza EMP' training tool on page III-9 to help people get used to identifying steps, resources and specific actions to reach a goal).
2. Decide on a format. If you already use a particular project management format, use it. If not, look at the samples provided and decide which one works best for the Team.
3. Understand what is causing the current situation/performance to be like it is. (Conduct a simple 'why-why' root cause assessment to ensure the actions taken address the base issues with current performance. See attached one-page guidance on how to conduct a 'why-why' assessment, page III-4).
4. Before putting pen to paper, assign small groups to brainstorm strategies and actions to meet a specific objective and target. (Try the Training Tool to Develop Alternative Actions or Strategies (a/k/a 'Bubble Up Bubble Down' or 'Brainwriting') (page III-14).
5. Develop draft Action Plans/EMPs that are understandable and clearly identify what needs to happen, by whom with what resources, and by what date.
6. Get them approved and start.
7. Review progress on a regular basis and make adjustments.

Tips

1. **Build on what has worked** in the past but **promote brainstorming** to identify other strategies and innovative approaches that could be tried.
2. **Check whether the Action Plan/EMP makes sense** by asking someone who has not been involved in its creation to read it and give feedback.
3. **Spend the time to develop measures** you will use to assess and communicate progress. Use measures that are meaningful to the Team and to key stakeholders.
4. **Use these Action Plans/EMPs to communicate** what you are doing and what you need from others.
5. **Use them to MOTIVATE and INSPIRE.**

Traps

1. **Including too much detail:** Don't get stuck in the forms—it doesn't have to be perfect the first time.
2. **Not having enough detail:** General references or actions may not be detailed enough—make it real and useful to you.
3. **Not including names:** Project management means roles, responsibilities and accountability are clear.
4. **Making it an end to itself:** The EMP/Action Plan is a tool to get you action; it doesn't have to be perfect but good enough to move to the next step. Put in dates to assess how things are going and change as needed.
5. **Missing deadlines without checking why:** There is nothing necessarily wrong in missing deadlines but you need to find out why and make necessary adjustments.
6. **Never checking back:** Remember, this is all about continual improvements—you can't improve if you are not checking back to see how things are going.

Worksheets and Training Materials

The following worksheets and materials should help in this effort:

- Why-Why Root Cause Evaluation (page III-4)
- Action Plan Worksheet (page III-6)
- Sample EMP Format (page III-7)
- Pizza EMP Worksheet (page III-10)
- Blank EMP Worksheet (page III-13)
- Training Tool to Develop Alternative actions or Strategies ('Bubble Up Bubble Down') (page III-14)
- Examples (page III-15)

What is a why-why analysis[35]?

It is a method of questioning that leads to the identification of the root cause(s) of a problem.

What is the purpose of a why-why analysis?

A why-why is conducted to identify solutions to a problem that address its root cause(s). Rather than taking actions that are merely band-aids, a why-why helps you identify how to really prevent the issue from happening again.

How do I conduct a why-why analysis?

A why-why is most effective in a team setting or with more than one person involved. Capture the input on a flipchart or a simple spreadsheet like the one below.

1. First start with the problem you'd like to solve. Then ask, "Why is x taking place?" You will end up with a number of answers. Jot these down.
2. Repeat the process for each of the answers to the first question.
3. Repeat the process for each of the answers to the second 'why' and continue until you've asked why 5 times.
4. When you've hit the 5th why, you usually have determined some root causes. Now you can identify specific action plans to address those root causes.

How do I make the why-why effective?

- **Involve the right people** – it helps to have those that are familiar with the process and the problem in the room so they are able to answer why something happened. It is also helpful to have someone with a fresh eye participate – often they ask questions that help those involved in the problem extract the real reasons something happened.
- **Avoid blaming – look for systemic problems.** You are looking for systematic solutions to the problem. Blaming an individual ends up only making people feel bad. If someone didn't turn the right valve, ask the question "What could have helped the person turn the right valve?" Could improvements in a procedure or labeling the valve have helped the individual?

[35] Also know as a Five Whys analysis, a why-why is based on a Japanese quality technique and its description by quality consultant Peter Scholtes. See Peter Senge's "*The Fifth Discipline Fieldbook*."

- **Get creative** – what systematic solutions might address the problem? Allow people to brainstorm and identify potential actions to address the issue. Later, go through the potential actions to identify the solutions that will yield the most effective results.
-

why #1	*why #2*	*why #3*	*why #4*	*why #5*	**Potential Action Plan**
Why don't we use more recycled paper?					
	It isn't easily accessible.				
		It isn't near the printer.			
			No storage space near printer.		
				Virgin paper stored near printer.	Store recycled paper in place of virgin paper.
		People don't know which paper it is.			
			It isn't labeled.		Label storage location for recycled paper.
	People don't know to use it.				
		We haven't encouraged anyone to use it.			
			No communication has taken place.		

ACTION PLAN WORKSHEET[36]

GOAL:

OBJECTIVE

TARGET DATE:

Action Items	Priority	Responsibilities	Schedule	Resources Needed	Comments

[36] Adapted from *Environmental Management Systems: An Implementation Guide for Small and Medium-Sized Organizations*, 2nd ed., NSF International, p. 33.

SAMPLE EMP FORMAT

ENVIRONMENTAL MANAGEMENT SYSTEM (EMS)			**Date:** **Page of** **Revision # Draft 1.0**
[EMS] Document #:	**EMP**	**Prepared by:**	____
[EMS] Document Title:	**[Title]_____** **Environmental Management Program**	**Approved by:**	
1.0 INDIVIDUALS RESPONSIBLE:			
2.0 ENVIRONMENTAL OBJECTIVE (e.g., reduce, increase…) 2.1 2.2			
3.0 RELATED TARGET(S) (_____by_____) 3.1 3.2 .			
4.0 SPECIFIC FUNCTION AND/OR DEPARTMENT:			
5.0 Target Date (Month/Year):			
6.0 Environmental Management Program: Action Plan			
6.1 How will this objective be met? 6.1.1 6.1.2 6.1.3 6.1.4 6.1.5 6.1.6 6.1.7			
6.2 What operational controls might support the achievement of this objective? 6.2.1			

6.2.2	
6.2.3	
6.2.4	
6.2.5	
6.2.6	
6.3	How will this objective be tracked?
6.4	What resources will be required to achieve this objective?
6.4.1	
6.4.2	.
6.4.3	
6.4.4	
6.4.5	.

TRAINING TOOL: 'PIZZA EMP WORKSHEET'

INSTRUCTIONS:

Spend a half hour with the team (in small groups) completing the following 'Pizza EMP'.

The Team leader should look for the following learning outcomes:

a) The importance of understanding the operation you are developing the EMP for. (e.g., "it would help if we knew how pizza operations worked, how much food waste they generate…")

b) The importance of defining the problem (e.g., "why do we care how much food waste we send off?")

c) The importance of defining and focusing on the problem while also putting it in context and connecting to other objectives and targets (some groups will go off on the larger solid waste reduction strategies but forget about the food waste even though it was clearly stated on the worksheet)

d) The importance of measures ("volume or weight of food waste?") and baseline conditions.

e) Some ideas are 'upstream' ideas—tackling the problem before it occurs—while others are focused more on managing the problem.

f) The value of grouping ideas into categories. In working with waste streams, a strong suggestion is to use the following waste hierarchy. First is:

- **Prevention**, then
- **Managing** (in this case, sorting the different waste streams and diverting the food), after which comes
- **Reuse/recycling**
- **Disposal**

TRAINING WORKSHEET: ENVIRONMENTAL MANAGEMENT PROGRAM PLANNING FORM

Make believe you have been asked to develop an Action Plan/EMP to reduce solid waste sent to a landfill from a pizza shop.

Facility: Pizza-By-Candlelight		**Location:**
Prepared By:	**Position:**	**Date:**
Approved By:	**Position:**	**Date:**
RELEVANT ENVIRONMENTAL POLICY COMMITMENT(S): Waste reduction; natural resource conservation; cost savings.		
OBJECTIVE: Reduce amount of solid waste sent to landfill.		**TIMEFRAME:** [put in school year]
TARGET: Reduce food waste sent to landfill from pizza-making operations by 50% from 2001 baseline.		**TIMEFRAME:** [indicate months]

Action Item #	Action Items(Steps To Be Taken)	Primary Responsibility	Other Personnel Having Responsibility or Role	Completion: Due Date	Resources Required (Internal and External)

FOR EACH ACTION ITEM, DETERMINE THE FOLLOWING:					
Action Item #	How will progress be monitored or measured?	How often will progress be monitored or measured?	Who is responsible for monitoring or measuring of progress?	Who is responsible for reporting progress?	What are the success indicators for each action item?

Adapted from Georgia Tech Energy and Environmental Center; contact Deann Desai at: or deann.desai@gatech.edu .

BLANK WORKSHEET: ENVIRONMENTAL MANAGEMENT PROGRAM PLANNING FORM EMP #:

Facility:		**Location:**
Prepared By:	**Position:**	**Date:**
Approved By:	**Position:**	**Date:**

RELEVANT ENVIRONMENTAL POLICY COMMITMENTS	
OBJECTIVE:	**TIMEFRAME:**
TARGET:	**TIMEFRAME:**

Action Item #	Action Items (Steps To Be Taken)	Primary Responsibility	Other Personnel Having Responsibility or Role	Completion Due Date	Resources Required (Internal and External)
1.					
2.					
3.					
4.					

Action Item #	Action Items (Steps To Be Taken)	Primary Responsibility	Other Personnel Having Responsibility or Role	Completion Due Date	Resources Required (Internal and External)
5.					
6.					

FOR EACH ACTION ITEM, DETERMINE THE FOLLOWING:					
Action Item #	How will progress be monitored or measured?	How often will progress be monitored or measured?	Who is responsible for monitoring or measuring of progress?	Who is responsible for reporting progress?	What are the success indicators for each action item?
1.					
2.					
3.					
4.					
5.					
6.					

TRAINING TOOL TO DEVELOP ALTERNATIVE ACTIONS OR STRATEGIES

'Brainwriting Exercise'[37] (also known as "bubble up, bubble down")

This is a brainstorming activity to assist teams in developing action plans.

INSTRUCTIONS:

Give each person in a small group (3 to 6 people) 12 Post-it notes© or small pieces of paper. Ask each person to identify 12 different possible actions or ways to accomplish a particular objective and target. People are encouraged to put down any and all ideas that might come to mind, as wild or infeasible as they might seem.

After everyone has their 12 ideas, one person starts by putting one sticky or piece of paper on a large piece of paper. The next person then takes one of his/her boxes/ideas and the group decides whether that box is 'better' than the box/idea on the table. If the group feels it is better, it goes on top of the existing box. The next person brings out another box/idea and the group again assesses where that alternative should 'rank'.

The process continues until all the boxes/ideas are out on the table in a rank order of 'best' to 'least feasible'.

This exercise quickly does the following:

1. Encourages discussion within the group about what makes an idea 'good' or 'feasible';
2. Identifies a large number of ideas about how to achieve a goal;
3. Identifies themes, overlap, and connections between strategies;
4. Makes evident that there are some strategies that get to the root cause of a problem while others are 'after the fact' solutions;
5. Pushes groups to identify strategies and actions that they might not otherwise think of;
6. Serves as a way to decide what strategies should be identified in the Action Plan.

[37] Adapted by Madeline Snow, UMass Lowell EMS Service Program, from *An Organizational Guide to Pollution Prevention.*, EPA/625/R-01/003, August 2001. Page 61.

EXAMPLE OF AN ACTION PLAN FOR EMS OBJECTIVE AND TARGETS

OBJECTIVE: Purchase "Greener" Janitorial Chemicals

TARGET(S): Replace 3 high-use products with "green" alternatives

BASELINE: January 2001 Janitorial Chemical Use (see January Use Audit – not attached)

ASPECT(S): Human health and ecological safety

Parameter	Measurement Frequency
Use of [Product # 1 and its substitute]	Quarterly, on the 10th of the month beginning April 10
Use of [Product # 2 and its substitute]	Quarterly, on the 10th of the month beginning April 10
Use of [Product # 3 and its substitute]	Quarterly, on the 10th of the month beginning April 10

OPERATION(S) THAT ARE SOURCE(S) OF ASPECT(S) ADDRESSED: Building services, Purchasing

ACTIONS PLANNED AND TAKEN TO ACHIEVE OBJECTIVE

[Consider what type of actions you are evaluating to achieve targets for objectives. Are there pollution prevention alternatives such as source reduction, material substitution, in-process recycling, or waste minimization that could achieve your objectives and targets? Try to find an action that addresses the source most directly.]

ACTION 1: Review purchasing records to determine high-use products

RESOURCES NEEDED: Purchasing records

DEADLINE: July 1, 2001 RESPONSIBLE PERSON: Jim S.

ACTION TAKEN: June 1, 2001 – Identified five high-use products for action: toilet bowl cleaner, carpet spot remover, glass cleaner, metal cleaner, and bathroom cleaner.

ACTION 2: Obtain current MSDSs for high-use products

RESOURCES NEEDED: MSDSs

DEADLINE: July 31, 2001 RESPONSIBLE PERSON: Jim S.

ACTION TAKEN: June 15, 2001 – Obtained MSDSs.

ACTION 3: Establish criteria to evaluate the environmental preferable purchase of janitorial products

RESOURCES NEEDED: EMS team to help establish criteria

DEADLINE: August 31, 2001 RESPONSIBLE PERSON: Jim S.

ACTION TAKEN: July 1, 2001 – Gathering criteria from other organizations, haven't yet selected one.

ACTION 4: Screen high-use products against criteria and determine target products to find replacements

RESOURCES NEEDED: MSDSs and scoring team

DEADLINE: September 31, 2001 RESPONSIBLE PERSON: Mike M. + Jim S.

ACTION TAKEN:

ACTION 5: Seek alternative products for targeted high-use products and screen potential replacements against criteria.

RESOURCES NEEDED: Alternative product MSDSs

DEADLINE: November 15, 2001 RESPONSIBLE PERSON: Mike M. and Jim S. working with custodial staff

ACTION TAKEN:

ACTION 6: Request samples of alternative products and evaluate performance. Establish contracts for approved alternative products.

RESOURCES NEEDED: Samples and vendor contact information, assistance from purchasing

DEADLINE: December 31, 2001 RESPONSIBLE PERSON: Mike M. and Jim S. working with custodial staff and purchasing department

ACTION TAKEN:

ACTION 7: Document use of alternative products and continue to evaluate performance.

RESOURCES NEEDED: Custodial feedback

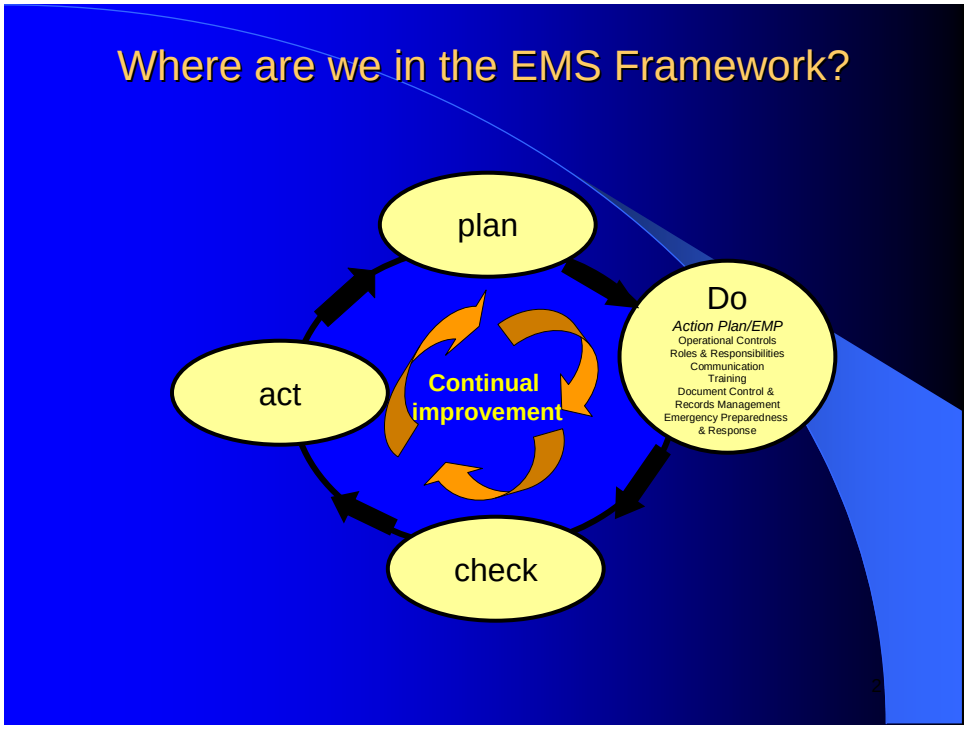
DEADLINE: Quarterly RESPONSIBLE PERSON: Mike M. and Jim S. working with custodial staff

ACTION TAKEN:

NOTES:

Responsible Person:	
Signature and Date:	

TIME TO PAUSE AND CHECK IN



The above figure shows where 'Action Plans/Environmental Management Programs' fit in the management system cycle. 'Operational Controls' (What parts of our operations do we need to focus on to meet our goals?) are discussed next.

BEFORE GOING ONTO THE NEXT SECTION, ASK YOURSELF:

- ☐ ***Action Plans/Environmental Management Programs:*** Are our plans clear? Are strategies, actions, responsibilities and resource needs identified? Have we built in dates to check in to evaluate progress?
- ☐ ***Performance Measurement:*** Have we identified how we will measure progress?
- ☐ ***Documentation:*** How are we able to show that we are making progress toward our goals?

WHAT'S NEXT?

1. Continue to build a management system to support your Action Plans/EMPs by continuing forward with:
    - **Operational Controls** (What parts of our operations do we need to focus on to meet our goals?)
    - **Roles and Responsibilities** (Who's going to do all this?)
    - **Communication** (How do we get awareness and involvement?)
    - **Training** (How do we make it real and who needs to be trained?)
    - **Document Control and Records Management** (Are we working with the right tools?)

BUILDING THE MANAGEMENT SYSTEM

Perhaps you have been working on specific projects and wish to make them more effective. Or perhaps you have been following the EMS process step by step, and have now completed:

- Phase II (PLAN), which included:
    - Identification of how your campus interacts with the environment and community (Aspects and Impacts, page II-1) and which are high priorities to address (Significance Ranking, page II-42)
    - Identification of what requirements apply to your operations (Identifying Legal and Other Requirements, page II-22)
    - Assessment of your campus' status with those requirements (Compliance, page II-29)
    - Identification of measurable goals to achieve (Objectives and Targets, page II-54)
- Action plans for each goal (Environmental Management Programs, page III-1)

Either way, the following sections provide tools so that you can review your operations (including projects, your EMS or initiative) to improve them and integrate them into day-to-day operations. The tools in these sections can help you build a management system to meet your goals, protect your campus, and sustain changes and improvements into the future. They include:

- Better documentation of "operational controls" (e.g., procedures, work instructions, alarms)
- Clear identification of roles and responsibilities (page III-36)
- Communication (Page III-46)
- Training (Page III-58)
- Managing and documenting records (Page III-71)

Also included is an important component of any management system--Emergency Preparedness and Response (Page III-87).

OPERATIONAL CONTROLS: WHAT PARTS OF OUR OPERATIONS DO WE NEED TO FOCUS ON TO MEET OUR GOALS?

Formal operational controls should be considered if activities are critical to meeting your goals, are causing compliance or liability problems, are completed inconsistently by different people, or require complex recordkeeping. Operational controls can be used to take projects that were developed under action plans (see previous section) into the mainstream of your campus operations.

> **What are they?** Operational controls are what you use to control how certain activities need to be conducted in order to meet the goals for your priority or 'significant' aspects. For example, you can use documents, SOPs, work instructions, logs, signage, equipment or alarms, and training.
>
> Examples of Operational Controls:
>
> - SOPs for preventive maintenance, inspections of equipment

- Written descriptions of practices adopted in order to meet your goals (e.g., documenting how and when you use web-based classes to reduce student commuting)
- Calibration requirements for monitoring equipment – energy meters, tank volume meters, overflow prevention or sensing devices
- Labeling - of materials such as hazardous products and waste
- Signage – emergency wash stations, master utility controls, evacuation route
- Equipment alarms—tank level indicators, alarms that notify operators when boilers are operating out of parameters.
- Contract language – contracts for waste disposal, recycling; procurement procedures.

Written control procedures should include (1) roles and responsibilities of those involved, (2) to what operations the procedure applies, (3) steps that must be followed to complete the operation or activity, and (4) any training required to execute the procedure properly.

Examples of operations at colleges and universities that should require written control procedures include:

- Hazardous materials management
- Hazardous waste handling storage and disposal
- Laboratory chemical tracking and use
- Pest management (typically in the form of integrated pest management plan)
- Fuels management (fueling, storage, and spill prevention)
- Storm water, waste water or air emission/discharge management
- Student or Worker safety
- Recycling or source reduction programs

In many cases, operational controls less formal than written procedures are equally effective. For example, an inspection log for the hazardous waste storage area, brief checklists, engineering or administrative controls, or signs with simple instructions can be simple operational controls.

What purpose do they have? The purpose of operational controls is to build and communicate environmental performance into daily operations so that environmental and sustainability goals are met. More specifically, operational controls help to minimize the potential environmental impact of a university's activities and operations. They also document critical institutional knowledge.

What do they make possible? Operational Controls help ensure that your college or university is running its day to day operations in a manner that will achieve specific compliance, environmental and sustainability goals. They also translate regulatory requirements into straightforward work instructions so that daily operations reflect how certain activities should be done to be in compliance.

Why do we need them? Without operational controls, the changes you want to make have less of a chance to be successful. Operational controls give faculty, staff and students an easy reference to how things are done, and provide a reminder of your critical environmental or sustainability practices.

When should we develop them? Operational controls can be identified or created or during the development of legal and other requirements, determination of significant impacts, and action plans/EMPs. You may already know where an operational control is needed without a lot of study—in that case, just go do it! (Note that you can develop operational controls even if you are doing one specific project; they are equally as useful in Sustainability Initiatives as they are in EMSs.)

Why do we need a procedure? A procedure documents how operational controls are developed on your campus and helps similar work in the future or in other parts of the campus

STEPS TO DEVELOP OPERATIONAL CONTROLS

1. Start by answering:
    a. Which operations within our project 'fenceline' are related to legal requirements and aspects that we have determined as having significant impacts?
    b. Is there a better, cheaper, faster, greener way to conduct the operation?
    c. Do we have written practices and procedures, and do they accurately reflect what is actually being done?
    d. What are the risks associated with the operation and how do we minimize them now? Are the controls adequate?
    e. How do we control this operation now and are the controls adequate?
    f. Do we have high risk areas where the approach is not documented or additional controls would minimize the likelihood of a problem?
    g. Who are the personnel responsible for carrying out the tasks to ensure proper management?
    h. What type of monitoring/measurement is needed?
    i. What expectations should we communicate to faculty, staff, students as well as suppliers and contractors?
    j. What training is needed?
2. Based on these answers, identify operations to be managed.
3. Determine what type of control is appropriate (e.g., alarm, physical control, written control).

4. If a written control (e.g., procedure, labeling, checklist, signage) is needed decide whether it:
    - Exists and is adequate
    - Exists and needs to be revised
    - Doesn't exist and needs to be created

    Start writing (or editing, if there is already something in place that is not working properly) and have someone test to see if it accurately reflects what needs to happen (and what is happening) to meet your goals (include what should be done; when it should be done; who needs to do it; what monitoring is required; what documentation, if any, needs to occur).

5. If it is another type of control, determine what resources and approvals are necessary to implement and put plans in place to do so.

6. Train those involved in the operations on the operational controls.

7. Use the operational controls you have decided are needed.

Tips

1. **Explaining Operational Controls:** Use real examples to understand the terms and why operational controls are important. (See the training tool on page III-26.)
2. **Be concise and simple:** The most effective procedures and work instructions are short, to the point, and can be understood by someone unfamiliar with the activity if they had to do the work.
3. **Start with what you already have**—keep it simple and improve what you have rather than throwing everything out and starting fresh.
4. **Find existing examples:** Determine if there are examples available. Do some research to see if another department or university has a similar control rather than re-inventing the wheel.
5. **Include the people most closely involved in the operation** in need of operational controls. In some cases, significant aspects are being addressed in some way already.
6. **Use visuals:** Controls don't have to be written—they can be presented in visual symbols that can be easily understood – for example, use flow charts (See an example from UMass Amherst on page III-31).

Traps to avoid

Writing procedures for everything: While the rationale for creating operational controls is to minimize environmental concerns and achieve consistent compliance, as a practical matter, writing and managing procedures for all the numerous and diverse operations at a college or university would be burdensome and time-consuming. Therefore, institutions should exert discretion as to the number and focus of written operational controls to ensure that the procedures that are written are clearly communicated and genuinely useful so they are implemented. Remember to be flexible.

Feeling that procedures will stifle creativity and innovation: Many resist and resent any effort to document how operations really run and equate procedures with bureaucracy. 'Procedure' is not a dirty word! You need to know who is supposed to do what, when, and where the information will be kept. While writing procedures may not be the most creative of writing assignments, work hard to get people to understand the value and role that writing this information down will have in changing a campus to make it more sustainable.

More and more colleges and universities are outsourcing operations, including for example food service and grounds maintenance. As a result, contractors and vendors may play a large role in your institution's efforts to improve compliance, environmental performance and sustainability practices.

Keep them in mind as you develop goals, action plans, and operational controls!

Remember:

SAY what you do,

DO what you say,

and prove it.

TRAINING TOOL: FOR A TEAM TO UNDERSTAND OPERATIONAL CONTROLS[38]

You've probably been to a hotel that is trying to reduce energy and water costs by not changing your sheets and towels every day during your stay. Your institution may even have its own conference and lodging center.

The following is an example of how operational controls connect with elements discussed in this Guide:

POLICY ELEMENT:	Commitment to Pollution Prevention
OPERATION:	Lodging (hotel, university conference center)
ACTIVITY:	Laundering of sheets and towels
ASPECTS:	Use of water, cleaning products, energy
IMPACTS:	Resource consumption (fuel, water) Water quality impacts
OBJECTIVE & TARGET:	Reduce consumption of water by ___ (#) by _____ (date) [as measured by total gallons or normalized on per guest basis]
ACTION PLAN:	Strategy to change to less than daily sheet/towel washing. Actions: Communicate to guests that the hotel is trying to change its operations to use less water and energy and that it is their option Train housekeeping
OPERATIONAL CONTROLS:	• Cards in rooms that explain the procedure to choose daily changing of sheets and towels • SOP for housekeeping (do not change sheets if card is on bed; only replace used towels that are left on the floor) • Training for housekeepers to follow SOP

CHECKLIST FOR HOUSEKEEPING

[38] Developed by Madeline Snow, UMass Lowell EMS Service Program.

WORKSHEET: TO BEGIN TO IDENTIFY WHAT OPERATIONS YOU NEED TO FOCUS ON IN ORDER TO REACH YOUR STATED GOALS FOR YOUR 'SIGNIFICANT' ASPECTS

WORKSHEET:

Significant Aspect	Associated Operations	Operational Controls

Note: You may have completed a similar worksheet or process to this one during the Aspect-Impact section of this guide. If so, use it to help identify the operational controls associated with your aspects and operations.

EXAMPLES[39] OF SIGNIFICANT ASPECTS AND OPERATIONAL CONTROLS

Significant Aspect	Associated Operations	Examples of Operational Controls
Solid waste generation	Receiving	Recycle cardboard into separate dumpster, post signs on all dumpsters that cardboard has a special receptacle
Solid waste generation	Office support	Place notices on copiers to use the double-sided feature and set copiers to default to double sided Issue directive against routine printing of email Place separate containers for different categories of recyclables Use form to send to stop multiple catalogues being received
Hazardous Waste	Laboratories	Post signs detailing proper waste handling Place secondary containment for proper waste management Post signs in laboratories for emergency contacts Log quantities of hazardous waste generated so there is constant knowledge of quantities stored
Potential for Spillage	Pesticide Storage	Place secondary containment under all pesticides being stored

[39] Adapted from *ISO 14001 Implementation Handbook,* James H. Schaarsmith, p. 59. http://www.deq.state.va.us/veep/pdf/isoguide.pdf

SAMPLE OPERATIONAL CONTROL FORM

Operations	Significant Aspect	Procedure Title	Responsible Party
Hazardous Waste Management	Potential Leaks, Spills	Hazardous Waste Storage Area Checklist	Maintenance Supervisor
	Potential Leaks, Spills	Material Handlers Monthly Operations Meeting	Maintenance Supervisor
	Potential Leaks, Spills, Compliance	Laboratory Waste Handling and signage	Laboratory Supervisors
Grounds Maintenance	Potential Contamination of Campus Hill Brook	Storm Water Visual Observation Form	EH&S Technician
Wastewater Discharge To POTW	Potential Damage To POTW Potential Water Contamination	Wastewater Sampling Procedure	Maintenance Supervisor
Wastewater Discharge To POTW	Potential Damage To POTW Potential Water Contamination	Preventive Maintenance – pH adjustment tank, monitor and alarm	Maintenance Supervisor
Underground Storage Tank Management	Potential leaks	UST Daily Inventory	Clerk III

ADMINISTRATIVE

A.) DOCUMENTS

1.) Program Manual
An expanded program summary that includes, rather than simply citing, procedures, job plans, etc.

2.) Standard Procedure
An overview of a procedure or process that designates the roles and responsibilities of the people involved in the process; may specify conditions or deliverables that mark the passing of responsibility from one person to another, and may include a contingency plan.

3.) Work Plan, SOP, Job Instructions
A detailed set of instructions or list of the actions that are required to complete a single procedure or task usually intended to be completed by one person or a small team. It may include a tool or deliverable such as a checklist to be completed as the procedure is conducted. This can include BMPs.

4.) Checklist
A list of actions or parameters to be checked. It may be part of, or may replace, an SOP. Depending on the application, the completed checklist may be retained as a record, or it may be a reusable laminated wipe-off sheet.

5.) Flowchart
A graphic representation of a process that may be part of, or replace, a standard procedure or a work plan.

6.) Operational Logs
Documentation of collected parameters of an activity that may be used to control the operation or ensure compliance.

7.) Information Systems – Real Time or Cumulative
Collection of parameters for an activity that may be used to control the operation or ensure compliance.

B.) TRAINING

1.) Training and Communication
Used as an administrative control to minimize deviation from required procedures. Could include meetings where inspectors meet to ensure consistency in program compliance enforcement.

C.) ASSESSMENT / EVALUATION

1.) Inspection or audit by a party external to the operation

2.) Self-audit

OPERATIONAL ACTIVITIES

1.) Running Inventory
Record of inventory, deliveries, emissions, etc that is updated on a specified frequency to enable adequate warning of approaching a regulatory threshold.

2.) Registration / Notification

Must qualify before operation can begin. Allows Program Administrator to get information from users before approving of an activity. Registrations describe the activity and provides the Program Administrator with a basis for training requirements. Approval is given based on review of the requirements and training completed.

3.) Procurement Process

4.) Chain of Custody

5.) Centralized Service

Controlling a service or activity by centralizing it. Could be a centralized place to get RAD signage, or that all disposal goes through one person/group, ensuring consistency and compliance.

6.) Preventive Maintenance Programs

Equipment maintenance and testing

7.) Contract Requirements

8.) Outsourcing

9.) Policy

PHYSICAL / ENGINEERING

1.) Signage and Labels

A locally posted instruction, warning, direction, information piece, reminder. It is generally short and very specific to the operation and the location in which it is posted. Example: red-striped bag for RAD disposal.

2.) Alarm

An audible or visible signal that a preset threshold of an operating parameter has been breached. Most useful when set to activate before the regulatory threshold to enable corrective/preventive action and avert a deviation.

3.) Instrumentation/Programmable Controls

A mechanical device that prevents a piece of equipment from being operated outside preset parameters. Examples are backflow preventers, lighting sensors, timing controls, programmable thermostats, equipment governors.

4.) Signal, Display, Monitor

Although not a control in itself, electronic real-time reporting of operating parameters contribute to control decisions made by a technician.

5.) Surveillance technology

Audio and video technologies enable local observation of meters, etc., at remote facilities.

6.) Meters

Monitoring of cumulative or real time parameters. (ex.- dosimeter)

7.) Physical control mechanism

Engineering control such as a fence, machine guard, bollards around fuel tanks, lock-out/tag-out, secondary containment, filters, oil/water separators, etc.

8.) Design or Operations Modifications

Could be a product/raw material change, a process change, or an operational change that affects the impact of an aspect.

University of Massachusetts

Amherst

Physical Plant Division

policy and procedures manual

Gs.14.DD.007B

March 6, 2006

From: P___ M___, Assistant Director Building and Grounds

Subject: Waste Oil Management

Purpose: To provide a process flow diagram that details the necessary steps to assure compliance with waste oil storage regulations and minimize the likelihood of a leak as well as to provide information about proper waste management practices. This process assures compliance with state hazardous and other waste regulations 40 CFR 279 Waste Oil and 310 CMR 30.200 Provisions for Recyclable Material and Waste Oil and the campus Integrated Contingency Plan

Action: See Process Flow Diagram, Attachment #1 – Waste Oil AST Inspection and Attachment #2 – Weekly Waste Oil Tank Inspection Form. The information below is meant to aid in proper waste management practices.

Labeling Waste Oil Tank:

- The sides of the tank should be clearly and visibly labeled throughout the period of accumulation
- The words “HAZARDOUS WASTE” should be labeled on the side of the tank
- “Waste Oil” must be labeled on the side of the tank to classify the type of waste
- “Toxic” must be clearly labeled on the tank so as to show the type of hazard associated with the waste
- The date that the period of accumulation begins should be labeled on the side of the tank
- Waste Oil must be shipped out 90 days from the start of accumulation regardless of the volume of waste.

Labeling for Mobile Containers:

- Mobile containers must be labeled, “HAZARDOUS WASTE” or “HAZARDOUS WASTE OIL.”

Management of Waste Oil Accumulation Area:

- There are two upper limits for waste accumulation; time and volume. Whichever is reached first determines the date on which you ship out your waste oil.
- The accumulation area must be secured so that no unauthorized entry can take place
- All containers must be closed ("capped vapor tight")
- All containers must be in good condition
- The area around tank/containers must be free of oily debris
- Empty Container drums should show no more than 1" of oil in bottom
- Containers/tanks must be located on impervious surfaces
- The waste oil tank should be locked when not in use

Hot Drain Filters:

- Puncture the filter anti-drain back valve or the filter dome end
- Hot-drain the filter at or near engine operating temperature but above 60 degrees Fahrenheit for a minimum of 12 hours.
- Include collected oil from filters with other used oil
- A skilled laborer will bring empty filters to IPF for recycling

Shop Towels and Absorbents Containing Waste Oil

- Used absorbent and towels should be stored in separate drums/containers with the lid closed at all times unless material is being added.
    - The drum/container with used absorbent should be labeled with the following: ***Oily Waste Absorbents Only***
    - The drum/container with the used towel should be labeled with the following: ***Contaminated Shop Towels Only***
- The used absorbent or towels should not be saturated to the point where it drips. If either drips they will need to be managed as hazardous waste.
- When the drum or container is full submit an on-line waste removal request at: ***http://www.umass.cems.sr.unh.edu/Waste/RequestRemoval.pm***.

Enclosures: **(1)** Waste Oil AST Inspection

(2) Weekly Waste Oil Tank Inspection Form

Distribution:

Director

Assistant/Associate Director

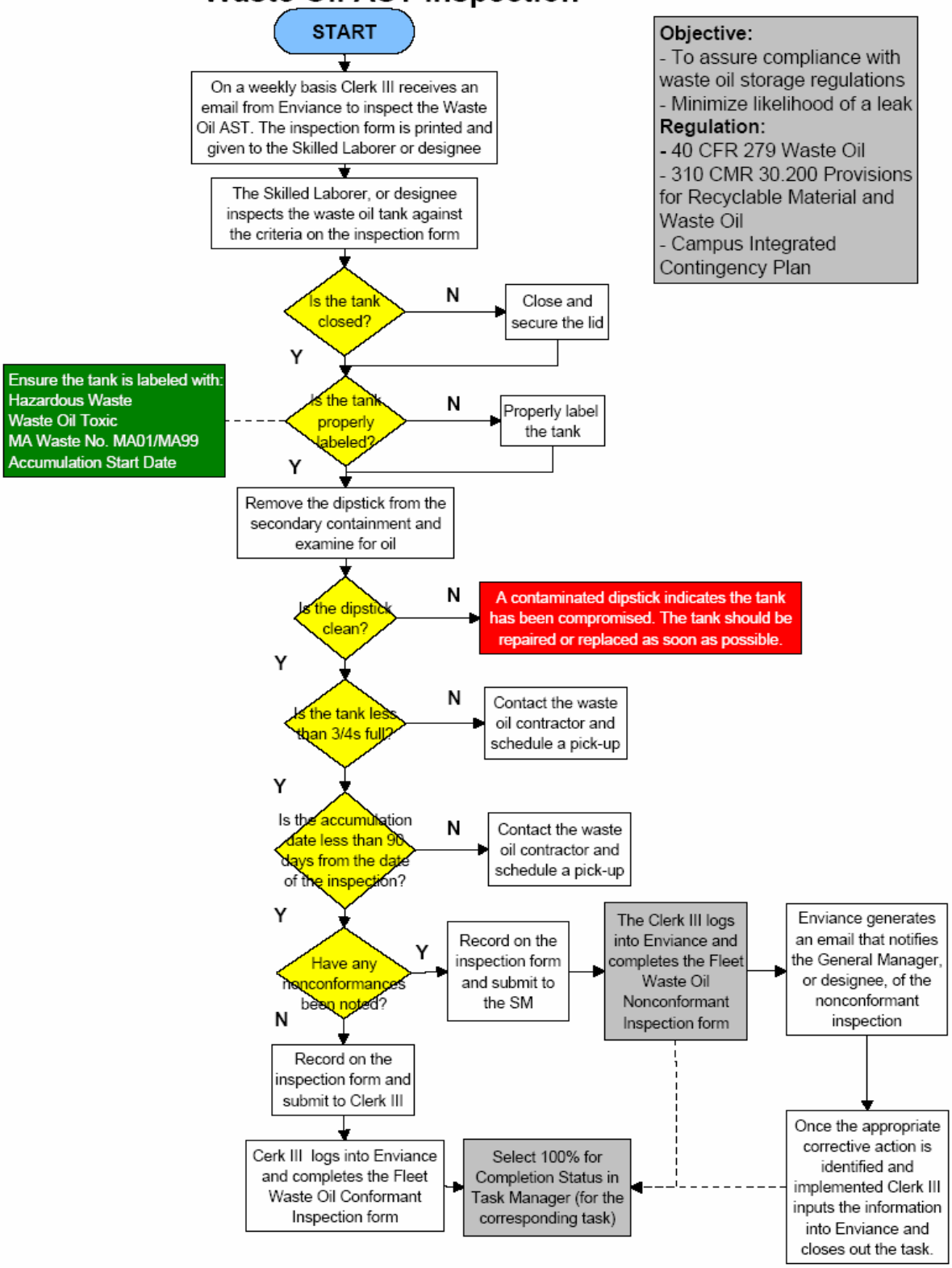
Executive Assistant

All Managers

All Supervisors

ATTACHMENT #1

Waste Oil AST Inspection



ATTACHMENT #2

UNIVERSITY OF MASSACHUSETTS

Fleet Services

WEEKLY WASTE OIL TANK INSPECTION FORM

Name: _____ **Date: _____**

INSPECTION FORM		
Is the tank closed?	Yes	No
Is the tank in good condition?	Yes	No
Is the waste located in a properly identified area?	Yes	No
Is access to waste storage tank restricted to unauthorized personnel?	Yes	No
Is secondary containment appropriate and in good working condition?	Yes	No
Does the waste label include the words “Hazardous Waste” AND “Waste Oil Toxic”	Yes	No
Is the accumulation start date listed and less than 90 days from the date of the inspection?	Yes	No

Comments: _____

SAMPLE PROCEDURE

Below is a sample procedure that describes how to identify what operational controls are needed. The Operational Control form can be used to document operations for which written control procedures are required; both existing procedures and procedures developed as part of this EMS should be recorded.

[College/University Name]	EMS Procedure	2.4
	Effective Date	
	Subject	Operational Control

Purpose This procedure is used to document and track which [college/university name] operations with significant environmental aspects require operational controls.

Step 1 Using the list of significant environmental aspects developed from the aspects review completed as part of Element 2.1, Environmental Aspects and Impacts, the EMS Manager will identify [college/university name] operations that potentially require written procedures.

Step 2 The EMS Manager will then identify operations for which operational control is achieved through existing procedures or practices.

Step 3 The EMS Manager with the assistance of appropriate [college/university name] departmental and facility staff, will identify operations with significant environmental aspects that require new procedures to achieve operational control.

Step 4 Depending on the significance and liability associated with a given operation, the EMS Manager, with the assistance of appropriate [college/university name] departmental and facility staff, will determine the level of detail, training required, and frequency of review and revision for each operational control; details will be recorded in the procedure for each operation.

Step 5 Documentation of operational control will be achieved using the Operational Control form and will be retained by the EMS Manager.

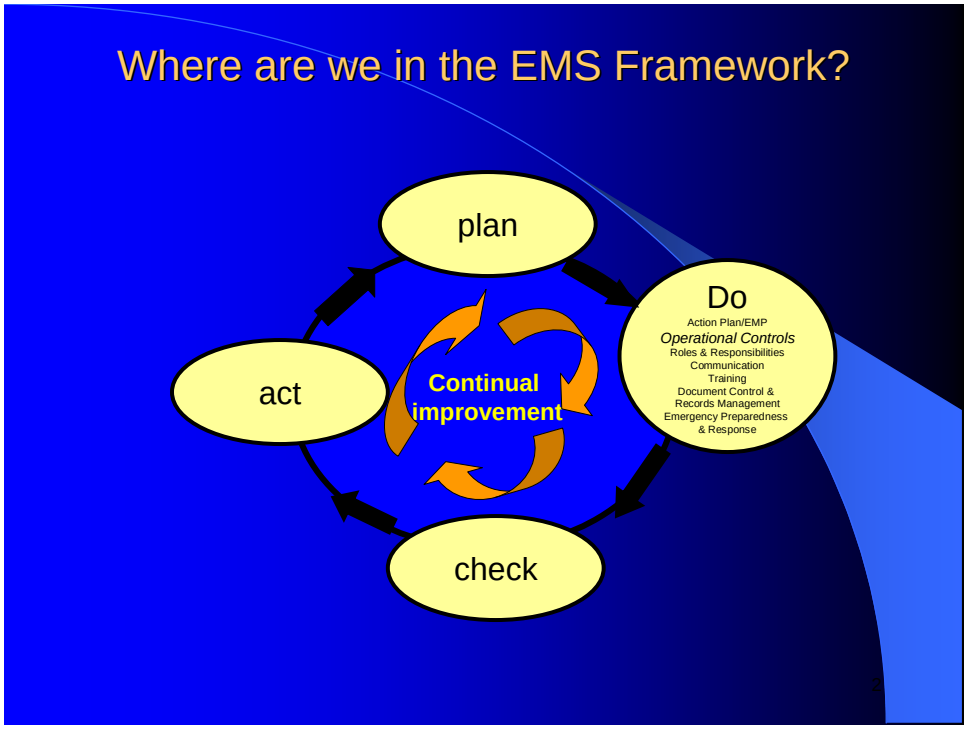
Responsible Person:	
Signature and Date:	

EXAMPLES OF PROCEDURES

See:

http://www.orcbs.msu.edu/environ/programs_guidelines/ems/procedures/Campus%20Operational%20Control.pdf and http://www.ehs.wsu.edu/esrp490/operationalcontrol.htm

TIME TO PAUSE AND CHECK IN



The above figure shows where 'Operational Controls' fits in the management system cycle. Roles and Responsibilities (Who's going to do all this?) is discussed next.

BEFORE GOING ONTO THE NEXT SECTION, ASK YOURSELF:

☐ ***Operational Controls:*** Have we developed what we need (SOPs, work instructions, signage, etc.) to manage our operations to meet our goals?

☐ ***Documentation:*** Are our procedures clear and understandable and controlled?

WHAT'S NEXT?

1. Continue on in developing the management system by addressing:
   - Roles and Responsibilities (Who's going to do all this?)
   - Communication (How do we spread awareness and increase involvement?)
   - Training (Who needs to be trained to make it happen?)
   - Document Control and Records Management (Are we tracking our efforts?)
   - Emergency Response and Preparedness (How do we respond to and prepare for potential emergencies?).

ROLES AND RESPONSIBILITIES: WHO'S GOING TO DO ALL THIS?

Everyone has an important role to play in day to day operations in order to stay in compliance and successfully implement a new project, initiative or management system. The level of responsibility will vary from person to person depending on their designated roles. By clearly identifying roles and responsibilities, each person knows what influence they will have and how it will affect their workload. Sometimes it is just a matter of adding some clarification to roles that are already established. This also gives credibility and authority to both ongoing and new efforts.

Top administration plays a very important role by providing the necessary resource commitment and giving high visibility to the program. Top administration should also designate a college or university representative who (1) ensures that a process to achieve the goals is established; (2) reports on performance over time; and (3) works with others to modify the process, management system or initiative when necessary.

What is it? An identification of who does what in order to meet your institution's compliance, environmental and sustainability goals.

What purpose does it have? It ensures that people are aware of (and accountable for) their roles and responsibilities in meeting goals. Any team(s) implementing your systems or initiatives also gets a clear understanding of who to go to when they need help or resources.

What's in it? A list indicating who has what roles in:

- A project, EMS or Sustainability Initiative
- Operations that most affect significant aspects
- Procedures that document existing practices or strive to improve them

Tip

When assigning roles and responsibilities, be mindful of your institution's size, internal structure and unique characteristics. Even if it doesn't always feel like it, smaller colleges usually have less hierarchy, more direct lines of communication, and faster decision-making processes. Because staff at smaller institutions often perform multiple functions, integrating environmental responsibilities with other functions can often simplify the organizational structure, roles and responsibilities and minimize use of resources.

Medium-sized and large institutions, on the other hand, may have significantly more specialized expertise and resources but also more bureaucracy; as a result, they may have even greater challenges in breaking down interdepartmental barriers and operating collaboratively to create an efficient and functional EMS, Sustainability Initiative or environmental improvement project(s).

What does it make possible? Articulating roles and responsibilities lets everyone know who is responsible for what aspects of your project or system, and is a major step in getting people to understand their roles and take on their responsibilities. Just asking helps to clarify relationships and responsibilities, particularly around specific procedures.

Why do we need this? Without identifying who is responsible for what, you run the risk that important things do not get done because the people responsible did not realize it, or didn't understand where they fit in the process. In the worst case scenario, you can end up with everyone pointing fingers at each other, excusing the lack of progress because everyone thought someone else was responsible.

When should we develop this? Roles and responsibilities start early in and throughout the process: Team members and leaders all have roles and responsibilities in developing an EMS, Sustainability Initiative, or projects. Assignments are included in Environmental Management Programs or Action Plans. As the EMS or Sustainability Initiative mature, are audited/reviewed and maintained, roles and responsibilities will also change.

How Various Units or Positions Can Support Your Efforts

Academic Deans and Department heads—*allocation of resources, incorporating your principles into the curricula, implementation, communication and support*

Human Resources—*training requirements and records, including environmental responsibilities in job descriptions*

Purchasing—*contractor specifications, environmentally preferred purchasing*

Legal Counsel—*identifying regulatory requirements and keeping information current*

Information Technology—*document control and management*

Facilities Management—*implement SOPs, identify opportunities for pollution prevention, sustainability practices*

Business Management—*tracking costs savings and resource expenditures*

Public Relations/External Affairs—*communication and outreach to stakeholders*

STEPS TO IDENTIFY ROLES AND RESPONSIBILITIES

1. Ask yourselves: Does the lack of clarity about roles and responsibilities constrain our ability to be in compliance, improve environmental performance and/or develop sustainability? The immediate answer might be "no" but it's important to dig a bit further. The training tool in the box, below, can help your Team either affirm that roles and responsibilities are clear or that there are some potentially risky holes that should be addressed.

2. Focus on roles and responsibilities associated with significant aspects AND roles and responsibilities in developing and maintaining the Sustainability Initiative or EMS.

When you developed Action Plans/Environmental Management Programs, you assigned roles and responsibilities. Roles and responsibilities are most effective within procedures to help define the interactions that will get the project accomplished. Writing them down clarifies gray areas of responsibility.

3. Use the sample responsibility matrices on page III-40 (or others) and begin to fill them out. (These discussions can be very interesting and reveal a lot about what is already working really well.)

4. Use the draft matrices as a communication tool at various levels in the hierarchy in your college or university. Modify them as needed.

5. Use the matrices as you move forward, as they identify who is involved in each element of your initiative(s) (as appropriate to the roles you've identified). Update the matrices as roles and responsibilities change, as new action plans are developed and as you complete training, communication and other responsibilities.

Training Tool: Roles and Responsibilities

Ask a team or group the following questions and have them map their responses out on large sheets of paper to show who would do what under the different scenarios.

- If an EPA or state inspector came onto campus, who would notify whom?
- If a violation were found, who would tell whom about it?
- If resources were needed to address the violation, who would make resources available?
- If the violation was the result of not following SOPs, who would do what?
- If someone had an idea about how the campus could 'green' itself, what would the avenue for getting the idea to be heard and implemented?
- If you need help getting the information to measure your progress, who would you go to in order to get that help?
- If the EMS, Sustainability Initiative or project is stalled, who would help to move it along?

It should become self-evident where roles and responsibilities are and are not clear as well as the need for better identification of roles and lines of communication.

Developed by Madeline Snow, UMass Lowell EMS Service Program.

Tip

Considerations in assigning and reviewing roles and responsibilities:

- Who is currently in charge of the activity being reviewed (if anyone)
- Personnel who need to be involved
- Training and resources required
- Results of previous audits
- Improvement of current structure
- Integration with other functions and existing management systems

As difficult as it might seem, consider incorporating EMS, compliance, or sustainability, roles and responsibilities into job descriptions and performance evaluations. When institutions do this, it becomes '"how we do business".

Traps to avoid:

Disregarding existing roles and responsibilities: Try to connect and integrate existing roles and responsibilities of EH&S managers, facilities managers, procurement managers, etc. around the significant aspect and goals you are trying to reach.

WORKSHEETS

See a sample worksheet (page III-40) that can help you identify roles and responsibilities.

Another version from Washington State University can be found at http://www.ehs.wsu.edu/EMS/emswsuresponsiblity.pdf.

RESPONSIBILITY MATRIX

	Administration		Environmental Health and Safety			Facilities and Building Maintenance			Academic Departments			Campus Environmental Groups	
Responsibility	President/Chancellor/ Provost	EMS/Stewardship/Sustainability Director/ Manager	EH&S Director	EH&S Staff	Student Staff	Department Managers	Field Supervisors	Field Staff	Department Head	Laboratory Supervisor	Laboratory Staff	Chemical Hygiene Committee	Sustainable Practices Committee
Communicate importance of environmental management, compliance, sustainability													
Track / analyze new regulations (and maintain library)													
Obtain permits and develop compliance plans													
Prepare reports required by regulations													
Comply with applicable regulatory requirements													
Coordinate communications with interested parties													
Train employees													
Integrate environmental into performance appraisal process													
Communicate with contractors on environmental expectations													

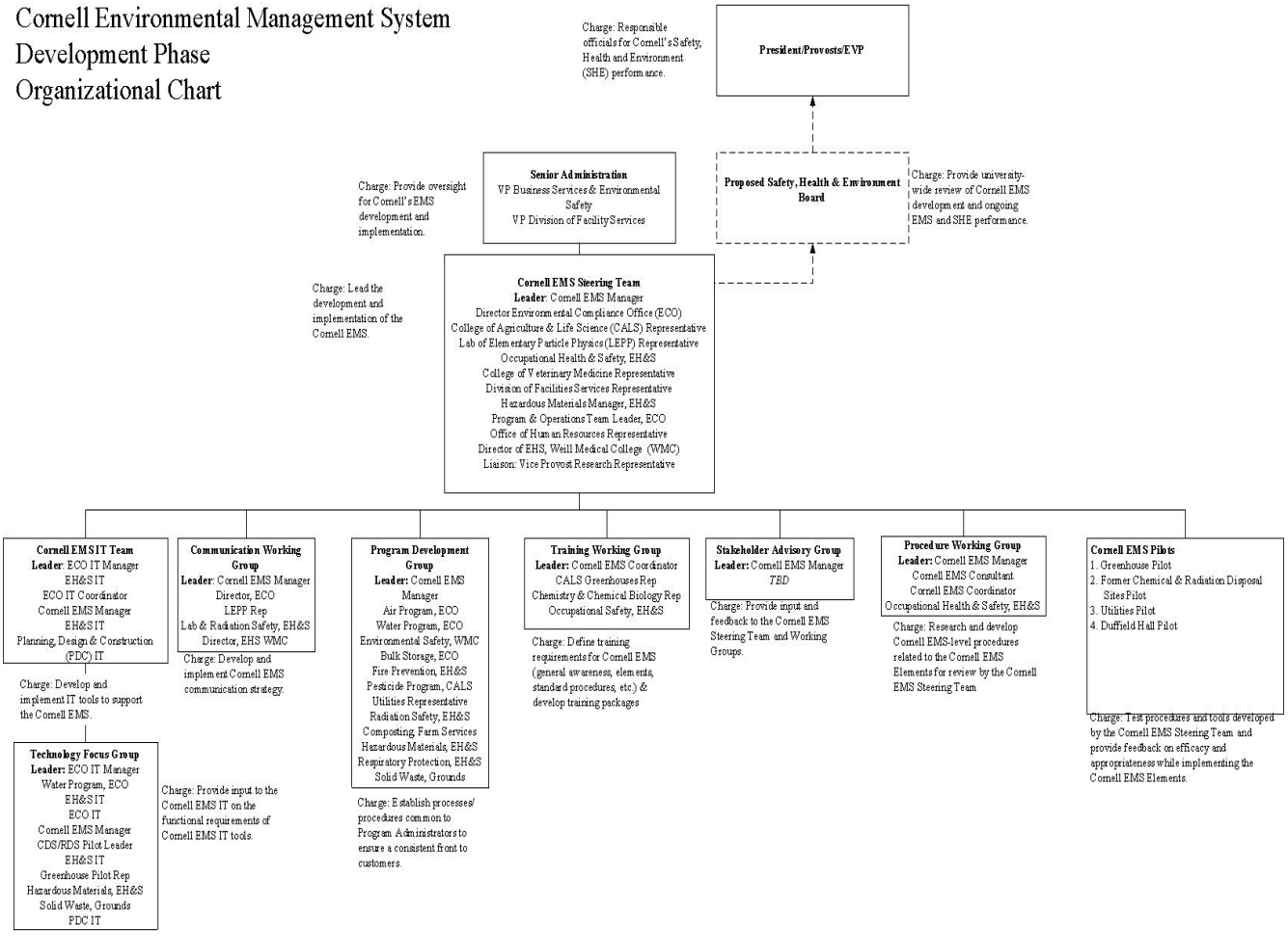
	Administration		Environmental Health and Safety			Facilities and Building Maintenance			Academic Departments			Campus Environmental Groups	
Responsibility	President/Chancellor/ Provost	EMS/Stewardship/Sustainability Director/ Manager	EH&S Director	EH&S Staff	Student Staff	Department Managers	Field Supervisors	Field Staff	Department Head	Laboratory Supervisor	Laboratory Staff	Chemical Hygiene Committee	Sustainable Practices Committee
Conform with organization's EMS requirements													
Maintain equipment / tools to control environmental impact (may require multiple tows for specific equipment)													
Coordinate emergency response efforts													
Identify environmental aspects of products, activities, or services													
Establish environmental objectives and targets													
Monitor processes with priority aspects													
Develop budget for environmental management													
Maintain EMS records (training, etc.)													
Coordinate EMS document control efforts													
Ensure that the EMS requirements are implemented and maintained in accordance with the [C/U name] environmental policy and procedures													

	Administration		Environmental Health and Safety			Facilities and Building Maintenance			Academic Departments			Campus Environmental Groups	
Responsibility	President/Chancellor/ Provost	EMS/Stewardship/Sustainability Director/ Manager	EH&S Director	EH&S Staff	Student Staff	Department Managers	Field Supervisors	Field Staff	Department Head	Laboratory Supervisor	Laboratory Staff	Chemical Hygiene Committee	Sustainable Practices Committee
Coordinate auditing efforts													
Report on the performance of the EMS to top administration for review and as a basis for improvement of the EMS													

Each EMP/Action Plan can be added to this matrix, or a separate matrix can be developed to summarize the plans and goals.

Source: Adapted from *Environmental Management Systems: An Implementation Guide for Small and Medium-sized Organizations*, NSF International, 2001

EXAMPLE OF ORGANIZATION CHART



SAMPLE PROCEDURE:

A sample procedure describes how to assign responsibilities and determine organizational roles for an EMS or Sustainability Initiative. The procedure can be implemented, in part, through the Responsibilities Matrix and Organizational Chart. The matrix and chart should be used to plan and assign responsibilities and can also be used to communicate these responsibilities to other people in the institution. After responsibilities have been assigned, it will be helpful to develop an organizational chart.

[College/University Name]	EMS Procedure	3.1
	Effective Date	
	Subject	Roles and Responsibilities

Purpose This procedure is used to determine the organizational roles and personnel responsibilities for the [college/university name] EMS.

Step 1 [college/university name] Administration will first designate an EMS Manager whose role is to oversee [college/university name] and lead EMS development and implementation. The EMS Manager and other EMS Participants selected by the EMS Manager are responsible for implementing the EMS.

Step 2 The EMS Manager will develop and assign EMS roles and responsibilities and document them using the Responsibility Matrix and Organizational Chart.

Step 3 The EMS Manager will communicate EMS roles and responsibilities.

Step 4 The EMS Manager and other EMS Participants will review and update the EMS roles and responsibilities every 12 months.

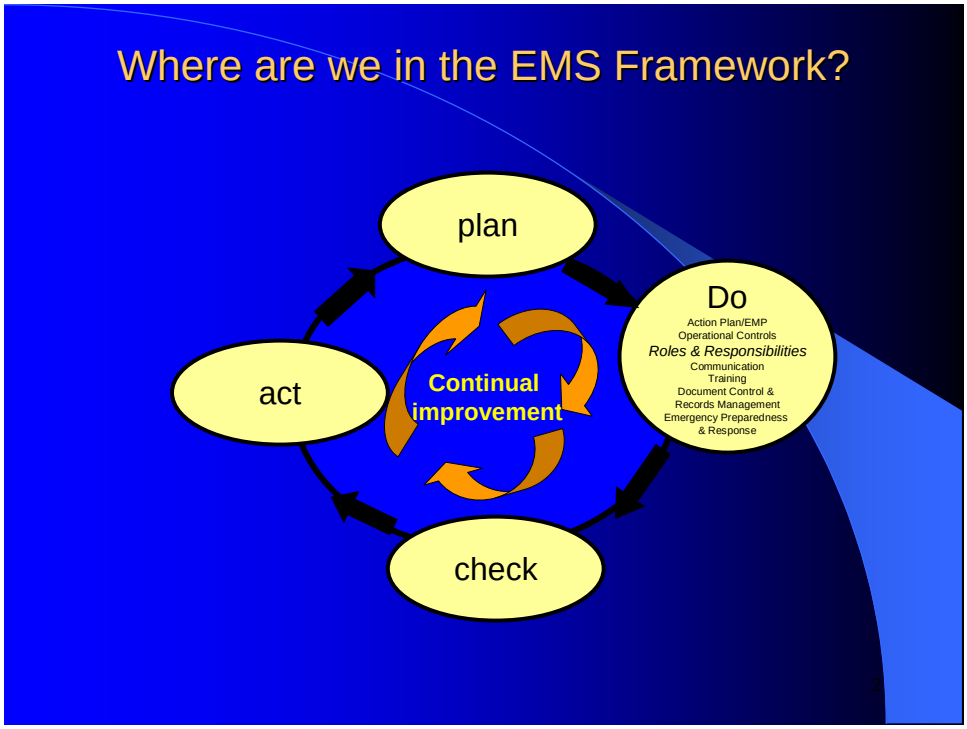
Step 5 Roles and responsibilities documentation will be retained at the facility for at least 2 years.

Responsible Person:	
Signature and Date:	

EXAMPLE OF A PROCEDURE

Another example of a procedure can be found at: http://www.ehs.wsu.edu/EMS/emsstructure.asp

TIME TO PAUSE AND CHECK IN



The above figure shows where 'Roles and Responsibilities' fit in the management system cycle. Communication (How do we get awareness and involvement?) is discussed next.

BEFORE GOING ONTO THE NEXT SECTION, ASK YOURSELF:

☐ ***Roles and Responsibilities:*** Are roles and responsibilities documented in a matrix, procedures, or job descriptions? Have we communicated this information?

WHAT'S NEXT?

1. Continue on in building the management system by addressing:
   - Communication (How do we get awareness and involvement?)
   - Training (Who needs to be trained to make it happen?)
   - Document Control and Records Management (Are we tracking our efforts? Are we working with the right tools?)
   - Emergency Response and Preparedness (How do we respond to and prepare for potential emergencies?).

COMMUNICATION: HOW DO WE GET AWARENESS AND INVOLVEMENT?

Continuous and creative communication is the key to successful implementation of any change, whether it's an EMS, Sustainability Initiative or any kind of project.

Communicate, communicate, communicate!

…And then communicate some more!

Because you are trying to get everyone involved, implementing, and maintaining these changes, initiatives, and projects, you will need effective ways to share information across your institution, both from the top-down and the bottom-up. Communication throughout development and implementation is important if efforts to improve environmental performance and move towards sustainability are to become truly integrated into everyday operations and decision-making.

Consider how to communicate to the community, neighbors, alumni/ae, and interest groups and review your interactions with contractors and vendors. Think of ways to regularly communicate your efforts and progress to environmental regulators as well.

What is it? This step is about planning the kinds of communication techniques you are going to use and when (and who is going to take them). It is also about assessing ('checking') how the techniques are working and changing them as needed.

What purpose does it have? Both internal and external communications should be planned and implemented to ensure that goals are met. Internal communication should explain the environmental/sustainability policy and address the roles and responsibilities that people have as well as progress toward specific objectives and targets.

It also identifies ongoing needs and how to communicate and to whom (e.g., when do I need to inform someone about a change in an aspect? Who do I communicate with when an incident occurs?).

What's in it? It includes a planned approach to communicating about the existence, progress, and challenges with your efforts to improve environmental performance, compliance, and sustainability. The communication process should also show how the institution responds to external and internal comments or inquiries about its EMS or Sustainability Initiative.

Effective communication can:

- Motivate people on your campus;
- Gain acceptance for your plans and efforts;
- Explain your environmental/sustainability policy and EMS and how they relate to the institution's overall mission and vision;
- Ensure understanding of roles and expectations;
- Demonstrate administration commitment;
- Get everyone involved in monitoring and evaluating performance;
- Identify potential system improvements;
- Educate the changing population on your campus about your project(s) and goals;
- Keep people motivated and interested in doing more;
- Reduce compliance problems and the wasting of time and resources.

What does it make possible? Effective communication makes your efforts visible, real, and integrated

into the life of your institution. It also helps you get the attention, help and resources you need to meet your goals.

Why do we need communication? You need to communicate for change to happen. If people don't hear from you, they usually think you're either not doing anything or you're doing something wrong. You need to communicate to keep the momentum going, to publicize successes and to increase awareness and interest in what you are doing. You also need to communicate when you need attention, help and resources as well as to let people know how they can support you and the Team's efforts.

Why do we need a procedure? A procedure makes it clear when internal and external communication will happen and how it will happen. It lets everyone know what you are going to be doing to communicate your project, EMS or initiative and it can also be used to support future requests for support and it can apply communication techniques to other issues and/or other parts of the institution.

Trap to avoid

Thinking that communication is only important in the beginning of an EMS, Sustainability Initiative or project: Increased communications up, down and across a campus are important in initial roll-out and buy-in. But they are even more important in everyday operations.

STEPS TO IDENTIFY INTERNAL AND EXTERNAL COMMUNICATIONS [40]

1. Identify your audiences: Think about what you are trying to communicate, to whom, how often, and through what methods.
2. Brainstorm and list the various individuals, departments, or groups who are either interested in or who will have an impact on your efforts. (use the Stakeholder Analysis tool previously introduced in Phase I-16).
3. Develop communication strategies that are tailored for your audiences. Use methods that have worked well on your campus and try some new approaches recommended here.
4. Develop internal and external communications plans (page III-50).
5. Try the techniques and check back to see how well they are working and if they should be amended or replaced.

Two particularly unique audiences at colleges and universities for **internal communication** are faculty and students.

[40] Note: if you are planning for ISO certification, it requires communication procedures and records specifically for responding to inquiries and/or complaints regarding your environmental programs and EMS.

Faculty should be part of the EMS or Sustainability Initiative and be solicited for input and advice. Faculty members are critical because many of their activities are often sources of environmental aspects (e.g., hazardous waste from laboratories or art studios). They are also teaching the next generation of leaders (through their curriculum and research).

Faculty members that work with chemical products containing hazardous constituents can be valuable advisors regarding the environmental aspects and impacts of the products used and the handling, storage, and disposal regulations that apply to waste material. Faculty will often see the connections between environmental, social and economic conditions and may have ideas on how to incorporate improvements in all three into the operations of the college or university.

Students, likewise, may have unique roles in an EMS or Sustainability Initiative. Some institutions rely on students to gather information about operations and processes linked to goals, objectives and targets. Furthermore, all students should be aware of their ability to affect environmental aspects related to waste generation (especially solid waste and recycling) and resource use (especially energy and water use). Students are the leaders of the future and have a major role to play in developing solutions to problems and improving campus performance.

Similarly, **external communication** is important. Communication with interested parties such as regulators, insurers, funding organizations, local community members, alumni, and emergency responders interested in the environmental impacts of the college or university should be addressed and documented. By maintaining meaningful dialogue and a proactive approach with external parties, an institution can fulfill its environmental/sustainability policy and commitments.

Tips

- "Communication is a two-way street"—create ways for people to provide their questions and ideas. If you ask for their input, make sure you acknowledge them and respond back. Even if you don't implement their ideas, it is important to respond.
- In this age of electronic communication, don't forget the value of a personal phone call, or visit to an individual or class.
- Consider physical as well as electronic bulletin boards for posting of interesting news and success stories.
- Ask for assistance from a marketing professor or class—this could be a great 'service learning' project.
- Keep it short and concise. People will be more likely to read it.
- Get creative.

EXAMPLES OF A PROCEDURE

Every communications plan will be slightly different (see one example from Cornell University on page III-52) but each one should include what is being communicated by whom to whom and how often.

Traps

Using the same old techniques that never quite worked and then wondering why no one is interested: Try new techniques. Engage other parts of your campus such as Communications and Marketing professors and classes and/or your campus' Communications Office.

Expecting them to come to you: No one committed to selling a product just waits for customers. Go to your stakeholders in any way possible.

Stopping communication because "we don't have much to show right now"—even if the Team has slowed down for a period of time, it is important to communicate and engage them in either reflecting on why things haven't been moving and/or to think about ways to move forward.

Thinking "I sent them the information—why didn't they read it?"— Do not assume people will read what you send them, particularly if it is long, doesn't get to the point right away or has a 24-hour turn around time for review. Instead of blaming the recipient, think about the ways the material or request is presented or communicated. Instead of a memo or email, can you attend a regularly scheduled meeting? Can you offer 'office hours' or accompany a laboratory inspector on a regular visit? Are there other ways you can get information out so that it is heard or read and used?

Losing the information in email scroll down. Everyone on a campus gets many emails a day from many departments. Unless you make an effort to differentiate your emails, they will get lost. Many of the EMS software packages available offer tools to differentiate communications to team members to cut through the email traffic.

WORKSHEET: PLANNING INTERNAL AND EXTERNAL COMMUNICATIONS BY STAKEHOLDER

USE THIS FORM TO PLAN INTERNAL AND EXTERNAL COMMUNICATIONS REQUIRED FOR YOUR EMS, SUSTAINABILITY INITIATIVE OR PROJECT.

Stakeholders	Why (intended outcome)	What to communicate	Who will communicate	How (media)	By when and how often	Notes	Actual Results

WORKSHEET: PLANNING INTERNAL AND EXTERNAL COMMUNICATIONS BY TYPE OF INFORMATION

Type of Information	Community Meeting	Individual Meeting	E-Mail/ Website	Newsletter	Press Release	Other	C/U Group
Environmental/Sustainability Policy							
Goals (Objectives and Targets)							
Successes: Waste Recycling, Reuse, Reduction							
Successes: Health and Safety							
Successes: Greening the Campus (procurement, building design)							
Successes: Energy conservation/reduction							
Successes: Money saved or costs avoided							
Results of Audits and Administration Review							
Successes: Compliance audits and inspections							
Changes Planned							
Permit Applications /Issues							
Annual Environmental/Sustainability Report							
Compliance status							
Other							

CORNELL STAKEHOLDER ANALYSIS AND COMMUNICATION PLAN

This document summarizes primary communication needs and pathways internal to the Program Development Group (PDG) and with outside stakeholders during the Development Phase of the Cornell EMS.

COMPONENTS OF THE PLAN:

Stakeholder Group – General group of stakeholders

Target Audience – Identifies specific individuals or groups within the Stakeholder Group.

STAKEHOLDER ANALYSIS:

Role – Defines the role of the stakeholders with respect to the Cornell EMS PDG.

Stakeholder Influence and Involvement (I/I) Index – Defines level of direct influence and involvement the stakeholder has relating to the work of the Cornell EMS PDG.

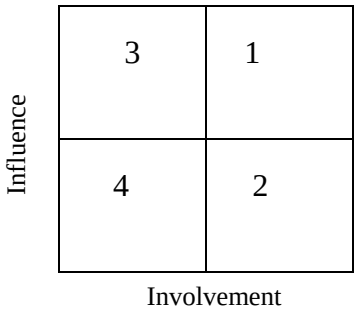
Stakeholder influence is categorized as:

1 – high involvement / high influence

2 – high involvement / low influence

3 – low involvement / high influence

4 – low involvement / low influence



Issues – Identifies main issues of interest to stakeholder

COMMUNICATION PLAN:

Objective – Summarizes key messages and information that needs to be communicated.

Frequency – Indicates frequency of communication

Communicator – Identifies the role of the person who will carry out communication objectives

Mode or Media – Provides suggestions for carrying out communication objectives

PDG STAKEHOLDER ANALYSIS AND COMMUNICATION PLAN, CORNELL UNIVERSITY

Stakeholder Group	STAKEHOLDER ANALYSIS			COMMUNICATION PLAN			
Target Audience	**Role**	**I/I**	**Issues**	**Objective**	**Frequency**	**Communicator**	**Mode or Media**
Group X	Group responsible for development of Cornell EMS Elements in the SHE programs represented	1	Individual program compliance requirements Individual Program Administrators support University divisions, units, faculty & staff and students in meeting SHE requirements Ensuring PDG deliverables are meeting the requirements of Cornell EMS	PDG project deliverables Meeting objectives and outcomes Action plan guidance and schedule updates Major decisions/proposals	Monthly As needed	A___ W___ – PDG Project Manager	PDG Monthly meetings Sharepoint Email
				Provide current awareness of other Cornell EMS work groups and their work to PDG Provide current awareness of other University group s and their efforts and how they may impact the work of the PDG (EUR task forces)	As needed	L___ C___ – CMS Manager	PDG Monthly meetings Sharepoint
Sub-Working Groups (SWGs)	Develop generic tools for Cornell EMS Elements that are adaptable to individual programs	1	Clear goals, tasks, and responsibilities. Adequate participation from members of PDG	Provide clear goals, tasks, and responsibilities to SWG	At start-up of sub-group As needed	A___ W___ – PDG Project Manager	Face-to-Face Email
				SWG presentations of work to PDG	Monthly As needed	Sub-Group Lead	Presentation Email
Steering Team	Provide overall direction of Cornell EMS CMS Element guidance	3	Obtain update on activities and progress Maintain overall direction	Provide status of PDG progress to Cornell EMS Steering Team Resources needed, if any	Every 2 months	A___ W___ – PDG Project Manager	Steering Team Meetings (report out)

				CMS direction updates provided to PDG	Monthly	M___ L___ – Cornell EMS Steering Team Liaison	PDG Monthly meetings
Technology Focus Group (TFG) Member	Gain input from PDG on IT tools to support Cornell EMS	2	Summarize Cornell EMS IT tool requirements Not development	Report functional, technical, and business requirements gathered to TFG Share information from TFG	As needed	W___ S___– PDG TFG Liaison	PDG Monthly meetings TFG meetings Sharepoint
Cornell EMS Training Working Group	Provide CMS-level tools and related training on Elements	4	Define training requirements for Cornell EMS awareness, standard procedures, and develop training packages	Provide training and guidance on Cornell EMS-level tools	As needed	Cornell EMS Training Working Group Lead	Presentation Participation in SWGs
Cornell EMS Pilots Pilot Leaders Pilot Members	Potential information resource for developing Element tools Work with individual PAs	4	May provide information or feedback to be considered	Provide current awareness of Pilot activities and progress	As needed	L___ C___ – Cornell EMS Manager Program Administrators working with Pilots	PDG Monthly meetings Email
Program Administrators (Not members of PDG)	Not directly participating in the PDG	2	Have access to Cornell EMS Element tools and guidance	Make guidance and Cornell EMS Element tools available Bring feedback to PDG	As needed	A___ W___ - PDG Project Manager	Presentations Face-to-Face Developed Tool

SAMPLE PROCEDURES

The following procedures for Internal Communication and External Communication describe how and when to initiate and document internal and external communication respectively and can be implemented, in part, through the Internal Communications form and External Communications form.

Each of the forms include examples of common types of communications, but each institution should tailor their communication plans to reflect existing effective methods and to take into account the unique characteristics of the audiences with which it interacts.

[College/University Name]	EMS Procedure	3.2a
	Effective Date	
	Subject	Internal Communication

Purpose This procedure is used to ensure adequate internal communication about the EMS [Sustainability Initiative].

Step 1 The ___ Manager will identify internal audiences, including faculty, students, staff, and possibly contractors of [college or university name] who play a role in everyday operations.

Step 2 The ___ Manager will determine the type of information that needs to be communicated including general information regarding the policy, individual EMS [Sustainability] responsibilities, specific waste reduction targets and measurements, or other goals.

Step 3 Depending on the audience and information to be communicated, the ___Manager will determine methods of internal communication. Initial forms of internal communication may include training, followed by meetings and postings via email, intranet, websites, newsletters, or bulletin boards.

Step 4 The ___ Manager will determine the frequency of internal communication depending on the types of information being communicated.

Step 5 The ___ Manager and other appropriate [college or university name] staff (identified in the internal communications form) will ensure that adequate internal communication occurs.

Step 6 Internal communications will be planned using the Internal Communications and the Emergency Response Communications forms. Records of all internal communication will be retained (i.e., for at least 2 years).

Responsible Person:	
Signature and Date:	

[College/University Name]	EMS Procedure	3.2b
	Effective Date	
	Subject	External Communication

Purpose This procedure is used to ensure adequate external communication.

Step 1 The ___ Manager will identify external audiences. External audiences may include suppliers, neighbors, community groups, local officials, insurers, alumni, other colleges and universities, regulatory agencies, and emergency responders.

Step 2 The ___ Manager will determine the type of information that needs to be communicated. Information may include waste reduction successes, permit applications for new processes, or future plans to change processes or practices.

Step 3 Depending on the audience and information to be communicated, the ___Manager will determine methods of external communication.

Step 4 The ___ EMS Manager will determine the frequency of external communication depending on the types of information being communicated.

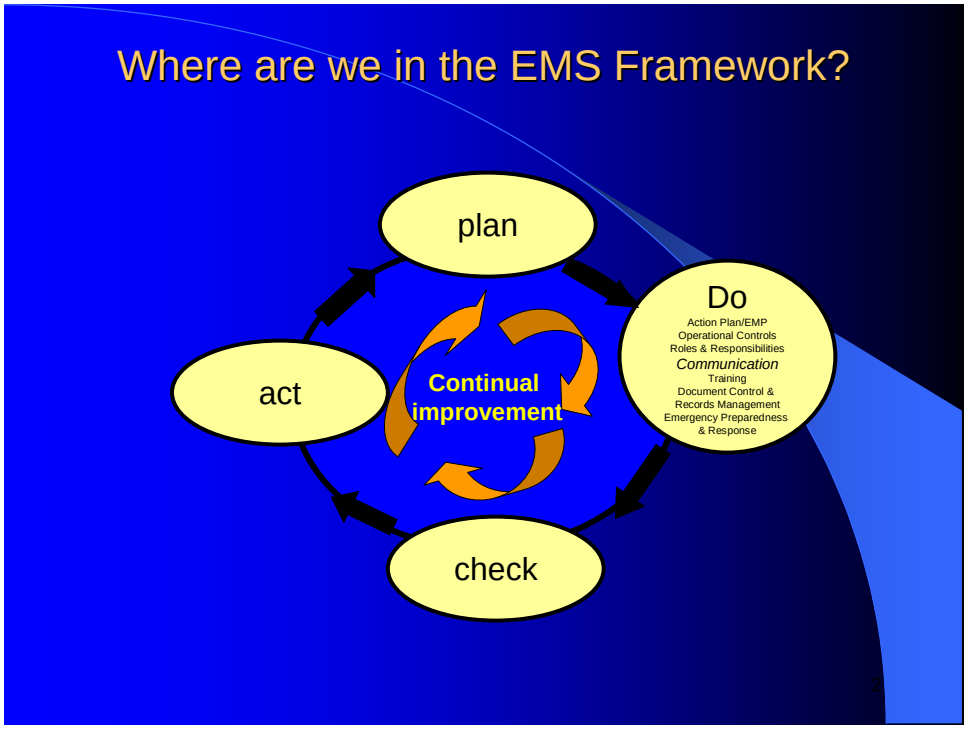
Step 5 The ___ Manager and other appropriate [college or university name] staff (identified in the external communications form) will ensure that adequate external communication occurs.

Step 6 External communications will be planned using the External Communications and the Emergency Response Communications forms. Records of all external communication documentation will be retained for at least 2 years.

Responsible Person:	
Signature and Date:	

Examples of procedures include http://www.ehs.wsu.edu/esrp490/communication.htm and http://www.orcbs.msu.edu/environ/programs_guidelines/ems/procedures/Internal%20Communication.pdf

TIME TO PAUSE AND CHECK IN



The above figure shows where 'Communication' fits in the management system cycle. Training (How do we make it real?) is discussed next.

BEFORE GOING ONTO THE NEXT SECTION, ASK YOURSELF:

- ☐ ***Communications:*** Have we developed lines of communications (internal and external) for key activities, events, and issues related to our goals?
- ☐ ***Documentation:*** Do we have communication written plans and procedures?

WHAT'S NEXT?

1. Implement communications activities and evaluate their effectiveness.
2. Continue on in building the management system by developing:
   - Training (Who needs to be trained to make it happen?)
   - Document Control and Records Management (Are we tracking our efforts? Are we working with the right tool?)
   - Emergency Response and Preparedness (How do we respond to and prepare for potential emergencies?).

TRAINING: WHO NEEDS TO BE TRAINED TO MAKE IT HAPPEN?

You've decided what environmental, compliance, or sustainability issue you want to focus on. You have set specific objectives and targets, developed action plans, operational controls, and have assigned responsibilities. Training is a crucial link in taking the planning and making it real at your college or university. But training, just like education, doesn't just happen. You need to be assured that everyone who plays a part in meeting the goals is trained and able to perform their functions.

What is it? This element looks at existing training and identifies where additional or revised training is needed to meet objectives and targets or to ensure that your operational controls will be implemented properly. It also looks at how information on training needs, participation, and results is maintained.

What purpose does it have? An overall training effort includes:

1. Awareness – to provide understanding of what the institution's EMS or Sustainability Initiative means for the campus and how it works
2. Task-Specific Training – to provide task-specific training on topics to aid progress toward goals, objectives and targets and ensure your operational controls are implemented
3. Training Required by Regulations – to comply with applicable environmental and health and safety training requirements

What's in it? An assessment of:

- Job functions that affect the environment and sustainability
- Current training
- Opportunities to adjust existing training materials, methods, and current training to include training on your EMS, compliance, or sustainability

What does it make possible? Training is important not only in any effort to improve compliance, environmental performance or sustainability, but it also provides more opportunities to communicate your goals. Your training programs give you the opportunity to tell people about the programs and projects under these initiatives and how they can contribute to the goals. Similar to the element on responsibility, training sets expectations.

Why do we need training? In order to meet your institution's compliance, environmental performance and sustainability goals, people have to be aware of, knowledgeable about and competent in their area of operations that affect those goals. Without training, particularly on SOPs and associated equipment, your institution's ability to meet its goals will be constrained.

When should we develop training? Right from the start. You should think about ways to increase awareness and understanding of environmental and sustainability issues, EMS, and existing compliance challenges. As you develop Action Plans/EMPs, and ways to manage or 'control' key operations, you will need to identify and address training needs.

Why do we need a procedure? It should be noted that training at colleges and universities is often further complicated by the complex and diffuse nature of their organizational and reporting structures as

well as the number of different departments in which people who are critical to the success of an EMS or Sustainability Initiative work. Faculty members are already teaching classes and students are already enrolled in classes for which they get credit, so including responsibilities to attend classes outside of their subject matter can be difficult. A procedure is needed to ensure that training is provided to those who need it in order to meet the institution's goals, objectives and targets.

Traps to Avoid

Training that is unconnected to existing work: Make the training connect with everyday concerns and values.

Over reliance on power point presentations: Use interactive, hands on exercises and approaches to training. If you use Power Point presentations, include photos taken on your campus to connect with the audience.

Too many boring bullet points: If you do use Power Point presentations, use photos and visuals. Don't load up the slides with too much text!

Tips

- Build on what you already have and what works.
- Incorporate EMS/Sustainability awareness training into existing training and consider making the training part of a regularly scheduled update.
- Use on-line electronic calendars, scheduling, and tracking tools.
- Consider on-line training as a way to accommodate varying schedules (make sure you can keep track of who has taken the training—this is a key record).
- Consider videotaping training sessions for use later as refreshers or with new employees.
- Factor training needs and abilities into hiring practices.
- Use existing orientation sessions as a way to 'train' students, research/teaching assistants and residential advisors.

STEPS TO DEVELOP AND IMPLEMENT TRAINING

1. Start by reviewing your current status[41]:
   - What is the existing process for environmental/sustainability training; does the process need to be changed and in what way?
   - What types of training (training matrix, page III-64) do we provide now (e.g., new employee orientation, student orientation, safety training, contractor training)?
   - Who is responsible for training? How do we determine training needs now? Who else might be involved?
   - Who is responsible for ensuring that employees, students and faculty are trained when necessary?
   - How do we track training and evaluate it to know if it's being effective?
   - How do we establish competency where needed (e.g., technicians, EH&S staff, HVAC maintenance, researchers in laboratories, students, purchasers)?
2. Identify Training Needs – what are the key job functions and activities where you need to ensure environmental/sustainability competency? Catalogue training needs for each employee or group using your findings from step 1(e.g., Chemistry Department Faculty, Grounds Maintenance crews).

   a) Starting with Awareness Training, fill in the Training Matrix on page III-62;

   b) Add Task-Specific Training relating to specific objectives and targets; and finally

   c) Add Training required by regulations (often apparent after performing a compliance review).

   This training matrix will help you determine "big picture" training needs and develop individual training plans according to each position or place in the institution. This tool might also be useful for managers when estimating training expenses and planning for new employee/student training and orientation. An example of a completed Training Matrix is also provided on page III-64.
3. Complete training plans for individuals or categories of people (i.e., landscaping staff or laboratory managers) using the tool provided.
4. Conduct Needed Training – Building upon existing training, identify resources and conduct training.
5. Maintain Training Records – Use the Training Form on page III-68 to record the dates training is planned and the dates that training occurred.
6. Evaluate Training Effectiveness – Review the impact of training on effectiveness through interviews and considering the results of Audits and Administration Reviews.
7. Improve training.

[41] *Environmental Management Systems—An Implementation Guide for Small and Medium-Sized Organizations,* p.42.

Potential Training Resources

- EMS/Sustainability Team Members
- On-line Training
- Departmental Professors
- Graduate Students
- Sister institutions
- Professional associations (e.g., http://www.NACUBO.org, http://www.AASHE.org, http://www.appa.org, http://www.CSHEMA.org, http://www.scup.org, http://www.c2e2.org)
- Human Resources
- For public institutions, state agencies
- Suppliers/Vendors
- Self-Directed Study
- Outside Consultants

Training modules should include:

- Awareness of the Environmental/Sustainability Policy, key commitments the institution has made, roles and responsibilities.
- Training on operational controls or procedures for specific department personnel affected (for example, purchasing policies for administrative staff if there is an environmentally preferable purchasing program, procedures for meeting pretreatment requirements if wastewater is sent to a POTW, or procedures or controls on waste from art studios if hazardous paints or metals are used, etc.)
- "EMS Auditing" for the internal EMS Auditing Team
- Special module developed for new student orientation

Examples of online training categories include many offerings, for example http://www.orcbs.msu.edu/training/training_toc.htm offers links to on line training in asbestos, hazardous waste and other topics, as well as course descriptions for environmental as well as health and safety courses.

TRAINING MATRIX WORKSHEET

		Safety, Health and Environment			Facilities and Building Maintenance				Academic Departments					Campus Environmental Groups	
	President/Chancellor	EH&S Director	EH&S Staff	Student Staff	Executive Manager/Director	Zone/Department Managers	Field Supervisors	Field Staff	Student Staff	Department Head	Laboratory Supervisor	Laboratory Staff	Student Staff	Director/President	Members/Student
AWARENESS															
TASK-SPECIFIC															
Hazardous Waste Management															
Spill Prevention and Response															
Chemical Handling															
Emergency Response															
Hazard Communication															
Personal Protective Equipment															
Fire Safety															
Electrical Safety															
Equipment Training (job specific)															

		Safety, Health and Environment			Facilities and Building Maintenance				Academic Departments					Campus Environmental Groups	
	President/Chancellor	EH&S Director	EH&S Staff	Student Staff	Executive Manager/Director	Zone/Department Managers	Field Supervisors	Field Staff	Student Staff	Department Head	Laboratory Supervisor	Laboratory Staff	Student Staff	Director/President	Members/Student
Laboratory Procedure Training															
[EMS] Audit Training															
REGULATORY															
Compliance Audit Training															
Regulation Review/Update															

			Environmental Health and Safety			Facilities and Building Maintenance					Academic Departments				Campus Environmental Groups	
	President/Chancellor	EH&S Director	EH&S Staff	Student Staff	Executive Manager/Director	Zone/Department Managers	Field Supervisors	Field Staff	Student Staff	Department Head	Laboratory Supervisor	Laboratory Staff	Student Staff	Director/President	Members/Student
AWARENESS															
EMS/Sustainability Awareness Training University EMS/Sustainability Status Updated Semi-Annual Policy Review & Development	X		X	X		X	X	X		X	X	X	X	X	X
Supervisor EMS/Sustainability Training EMS/Sustainability Awareness Training Development Objective and Target Communication Training Policy Implementation Training		X			X	X	X			X	X			X	X
TASK-SPECIFIC															

		Environmental Health and Safety			Facilities and Building Maintenance					Academic Departments				Campus Environmental Groups	
	President/Chancellor	EH&S Director	EH&S Staff	Student Staff	Executive Manager/Director	Zone/Department Managers	Field Supervisors	Field Staff	Student Staff	Department Head	Laboratory Supervisor	Laboratory Staff	Student Staff	Director/President	Members/Student
Hazardous Waste Management 40 – Hour OSHA Training & Certification - University-Specific Policy Review			X	X			X	X			X	x	X		
Compliance Audit Training		X	X												
P2 Communication and Implementation Training		X	X			X	X				X				
Laboratory Procedure Training Laboratory Policy Review Laboratory P2 Training		X	X								X	X	X		
[EMS] Audit Training		3-4 Auditors should be chosen to conduct EMS Audit. This should be a rotating responsibility among EMS Staff. Note: If possible, ensure staff does not audit their own facilities to preserve independence of the audit.													
REGULATORY															
Compliance Audit Training		X	X		X										
Regulation Review/Update		X	X		X	X				X	X	X			

ENVIRONMENTAL MANAGEMENT SYSTEM

COMPETENCY AND TRAINING RECORD

Employee's Name/Position Title:					**Supervisor Name/Title**:			
Activity/Skill	EMS Required Training	Job Related Training	Date Training Scheduled	Date Competence Demonstrated	Supervisor Initial	Degree/ License/ Certification	Recurring Frequency	Significant Aspect

The employee has successfully demonstrated competence in the identified activities specific to their job responsibilities.

EMS Awareness/Policy	Yes	Yes		02/11/02	See file		A	ISO Certification
Boiler operation	Yes	Yes		02/11/02	See file		A	Energy use, water use, air pollution, resource depletion
Water treatment chemical use	Yes	Yes		02/11/02	See file		A	Potential for spills and leaks
Fuel oil storage tank	Yes	Yes		02/11/02	See file		A	Potential for spills and leaks
Oil disposal	Yes	Yes		02/11/02	See file		A	Potential for spills and leaks
Fluorescent lamp and ballast disposal	Yes	Yes		02/11/02	See file		A	Mercury contamination, PCBs

Battery disposal	Yes	Yes		02/11/02	See file		A	Chemical contamination
Scrap metal disposal	Yes	Yes		02/11/02	See file		A	Can be recycled
Chemical Spill Control Training	Yes	Yes	06/13/01		On file		2A	NA
Auditor Training	Yes		07/11/01 10AM 01/17/02 1PM		On file		A	NA
Chemicals Fundamentals	Yes	Yes	03/12/02		See file		NA	NA
Legal & Other Reqs.	Yes	Yes		02/11/02	See file		A	EMS requirement
The instructor has discussed the consequences of deviating from EMS approved procedures, processes, or activities.								

(JOB FUNCTION) TRAINING PLAN

SUBJECT: _____

DATE:

**All planned and completed training should be recorded below; attach training agendas, materials, and sign-in sheets as appropriate.*

Employee Name	Date Planned	Date Completed	Signature of Employee

SAMPLE PROCEDURES

The following sample procedure shows how a college or university developing and implementing a training program (1) achieves awareness of the project, initiative, or EMS, (2) provides task-specific training related to operational controls, and (3) provides training required by regulations.

[College/University Name]	EMS Procedure	3.3
	Effective Date	
	Subject	Training

Purpose This procedure is used to develop and implement a training program for participants that (1) achieves awareness of the [name project or EMS], (2) provides task-specific training related to operational controls, and (3) provides training required by regulations.

Step 1 The [EMS Manager/Sustainability Director] will identify training needs for each employee by completing the [EMS] Training Matrix and identifying training needs in any of three categories: Awareness Training, Task-Specific Training relating to specific objectives and targets, and Training Required by Regulations.

Step 2 The [EMS Manager/Sustainability Director] and others will review past training and the nature of the faculty, laboratory workers, and employees' work and develop training plans for faculty/staff/employees. Training plans will be developed, reviewed, and revised when the following events occur: a new hire is made, an individual's role or responsibility changes, a new type of material, process, or equipment, or a new regulation is introduced to a department or functional area.

Step 3 The [EMS Manager/Sustainability Director] will arrange for and/or conduct needed training according to the schedule identified in the individual training plans.

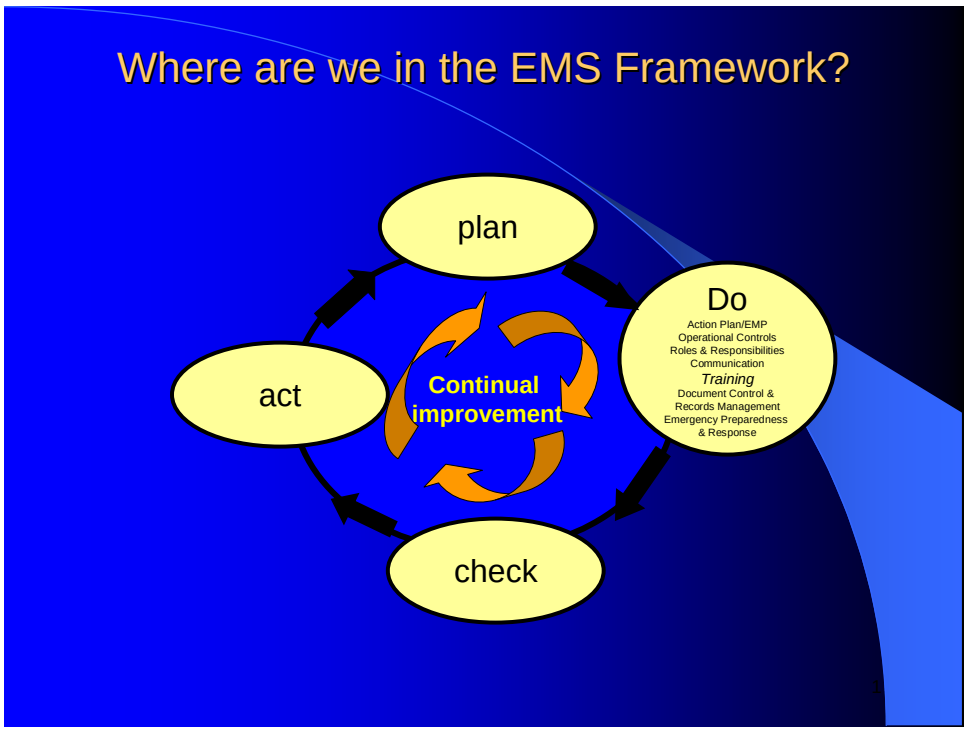
Step 4 The [EMS Manager/Sustainability Director] will document dates, attendees and subject for past and planned training in the individual training plans. Training documentation will be retained at the campus [SHE office,eg] for at least 2 years.

Step 5 Training effectiveness will be evaluated annually as part of the administration review to ensure that the training is contributing to the [project/initiative/EMS] being implemented effectively; appropriate changes to the training program will be made based on the findings.

Records Step 4 Training lists

Responsible Person:	
Signature and Date:	

TIME TO PAUSE AND CHECK IN



The above figure shows where 'Training'' fits in the management system cycle. Document Control and Records Management (Are we working with the right tools?) is discussed next.

BEFORE GOING ONTO THE NEXT SECTION, ASK YOURSELF:

☐ ***Training:*** Have we identified who needs to be trained in order to meet our goals? Who is responsible for ensuring training is provided and delivered? Who is keeping track? How will we assess whether training is effective?

☐ ***Documentation:*** Do we have a written procedure that documents how training needs are assessed and how training is delivered and assessed.

WHAT'S NEXT?

1. Continue on in building the management system by addressing:

   - Document Control and Records Management (Are we tracking our efforts? Are we working with the right tool?)

   - Emergency Response and Preparedness (How do we respond to and prepare for potential emergencies?).

DOCUMENT CONTROL& RECORDS MANAGEMENT: ARE WE TRACKING OUR EFFORTS? ARE WE WORKING WITH THE RIGHT TOOLS?

Have you ever come across a document (policy, SOP, application, form) and found that you couldn't tell whether it was current, revised, approved or obsolete? If these documents were 'controlled' you would know immediately.

What is it? Document control and records management are the way to keep track of the many documents an EMS or Sustainability Initiative is built on and needs in order to meet its goals. Even if you are not developing an EMS, you need to keep track of policies, records, procedures, etc.

What purpose does it serve? Document control ensures that documents can be:

- easily located;
- periodically reviewed; updated as needed; and
- removed when obsolete.

Records management enables you to keep track of what you are doing and to demonstrate that your institution is implementing its EMS, Sustainability Initiative or projects as intended.

What's the difference between a document and a record?

Documents are written instruments used to keep a management system functioning. These may be revised or changed as your management system develops.

Records provide evidence, or proof that the organization is actually implementing the environmental management system or sustainability initiative as designed and the procedures and work instructions are being carried out.

Many organizations develop an EMS manual to support their efforts. It can be comprehensive or narrow in focus, depending upon the organization's interest.

An EMS manual would typically include: definitions, scope, environmental policy, resources/roles/responsibilities/authorities, system procedures, and appendices that include related information, plans, training assessments, results of compliance evaluations. EMS manuals can be used to give an overview of the system, and point the reader/user to where the individual procedures/documents/records are to be found.

See http://informit.mit.edu/ehs-ms/manual_intro.html and http://www.ehs.wsu.edu/esrp490/emsprocedures.htm .

What's in it? Documents and records might include:

Documents (forms, procedures, etc.)	Records (evidence)
List of emergency contacts Maintenance manuals Standard Operating Procedures Contractor contact info Policies Permits	Training records Delivery logs/bills of lading Hazardous waste manifests Calibration results Audit reports List of significant aspects
Example using HVAC activities	
Equipment manuals and operational control procedure for inspection, cleaning and maintenance	Schedule and checklist for inspection, cleaning and maintenance
Documentation of changes made to the system Updated procedures to reflect these changes	Inspection and maintenance log
Standard Operating Procedures for HVAC system maintenance	Record of staff training (type and attendance) on procedures

Controlled documents should be 'kept' in a central location (in many cases electronically), usually under the control of the EMS or Sustainability Director (in other words, there should be only one person, or a small group of people working very closely together, who update and disseminate controlled documents).

In addition, controlled documents should have the following features at a minimum:

- Effective date
- Approval signature and date
- Copy number (if more than one controlled copy is required)

What does document control and records management make possible? 'Controlling' documents ensures that everyone is working with approved and up-to-date documents. Managing records well improves communication while also increasing likelihood of success. Records provide the evidence that actions were completed. Having a good way of managing documents records that are associated with regulatory compliance (e.g., permits, monitoring data, reporting) also improves compliance and relationships with regulators.

Why do we need document control and records management? You need to have some way to keep track of the information associated with your project, sustainability initiative or EMS. And the bigger the project, the more critical the need for managing the information associated with it. Documents and records are also essential to the establishment of an EMS and the management of significant aspects. They are critical tools in implementing a Sustainability Initiative or managing projects. Documents are

written instruments used to keep a management system functioning. Records are objective evidence, or proof, that the institution is implementing the system or project as planned and the procedures and work instructions are being followed.[42]

Without knowing what procedures are draft, obsolete, or have been replaced by others, you run the risk of following old procedures and instructions that may impede your progress in meeting goals, or you may end up doing something that's just plain wrong.

Records management is often viewed as bureaucratic, but it is hard to imagine a process or system operating consistently without keeping accurate records. Records are required as evidence for many compliance requirements. Good records will also benefit your Team members while they develop, implement, review, and revise your efforts to achieve high performance. Records will provide the information to track your success! It may occasionally be necessary to prove the effectiveness of your approach to people outside the institution, including community organizations, environmental groups, or a "registrar" that has been asked to certify the EMS as conformant to an environmental standard such as ISO 14000/14001.

When should we do it? As early as possible!

Why do we need a procedure? Without a procedure, you cannot be sure that people are working with the same set of documents and that the people who need access to them actually have access. It's hard to create a process to keep track of this important information without writing it down.

Anyone who works or studies at a college or university uses various documents such as procedures, work instructions, and forms every day. To ensure that people are consistently performing their jobs and functions in the right way, an institution must provide them with the proper tools. In order to meet compliance, environmental, and sustainability goals, these 'tools' include up-to-date procedures, instructions, and other documents. Without a mechanism to manage these documents, the institution cannot be sure that people are working with the right tools.[43]

STEPS TO MANAGE DOCUMENTS AND RECORDS

Controlling Documents: Ask yourself[44]:

- What document format works best for our college or university?
- Will a paper process or an electronic process or combination be best for us?

[42] *An Environmental Management System Troubleshooter's Guide for Local Governments.* p. 50.

[43] *Environmental Management Systems: An Implementation Guide for Small and Medium-Sized Organizations*, p. 50.

[44] *Ibid*.

- Do we already have a system (e.g., in the business office) that we can use or modify to work for us?
- Who has responsibility and authority for creating and revising documents?
- Which documents should be controlled?
- What are the most important pieces of information for us to keep track of (to be sure we have the most current version, that we want to put up on our intranet site, that we think we'll need to disseminate, etc.)?
- What documents do we already have?

1. Use the answers to decide on a format and process that will build on what you have and will work for your campus.
2. Prepare an index (see sample index , page III-78):
    a. Consider the option of creating a document inventory to capture all existing documents and identify duplicates or gaps. The inventory can then become your document control index.
    b. After you have prepared your document control index (if using an electronic system, this is automatically done), remove duplicates and develop a plan to fill in the gaps.
3. Based on what you decided in Step 1, develop a procedure for document control.

Managing Records:

1. Likewise for records:
    - Identify what records are required—what would someone look for or need if they were trying to see how you're progressing or to find out if you were implementing an EMS or Sustainability Initiative?
    - What records do you need for compliance requirements?
    - What records do you already have and how are they managed? Are changes needed for better management of records (linking them to you efforts to manage documents)?
    - Think about who needs access to what records and in what circumstances.
2. Make a list of what records you need and those you have. (Focus on records that add value—don't get overloaded.)
3. Make sure the records are accurate and complete. Fill in any gaps.
4. Develop a procedure for records management based on what you developed for documents and what you learned in Step 1.

Why use a computerized document control system?

There are several 'off the shelf' software products specifically designed to support an organization's development, implementation, and management of an EMS. They can offer:

- Better communication between team members
- Easy access to routine environmental and EMS documents and records
- Access to regulations and other requirements
- Database query, reporting and updating
- Document repositories
- Enhanced project management
- E-mail based notification systems with escalation functions
- Calendar and EMS milestones and progress functions
- EMS report generation tools
- Information access security controls

Ask around, try free demos and see what might work for you.

Tips for working with your information technology (IT) department

1. Ask your computer department to look at off-the-shelf software to automate as much of the day-to-day compliance work as possible. Specifically, look for:
    a. Chemical tracking / inventory / storage / disposal software
    b. Electronic records management software (assuming your institution does not already have a system in place)
    c. On-line (via your campus intranet) access to Material Safety Data Sheets
2. Ask about security controls for controlled information (such as physical location) within these software systems, especially if your university works with:
    a. Drug Enforcement Agency or Board of Pharmacy controlled substances (such as in a biotech research building)
    b. Radioactive materials (such as in an engineering research building)
3. Find out about options for long-term archival of electronic records – your IT department should be able to give you recommendations and handle off-site storage.
4. Remember to consider emergency access for non-university personnel (such as the local fire department) to information about hazardous materials on campus in the event of a fire or other disaster.
5. Provide a dollar and time limit for your IT department to put any systems in place so that "gee whiz" technology factors don't overwhelm the ultimate goal of any automation.
6. Ask to be involved in any meetings with vendors or prospective vendors – do not simply turn over this aspect of your program to your computer department; their focus is likely going to be more on the technology and less on your program itself.
7. Spend a few minutes reviewing the Electronic Content Management Association's website to give yourself some ideas of both the capabilities and the costs of various document management systems before you talk with your computer department.

--John Avellanet, Cerulean Associates

Tips

- Start early!
- Provide guidance about and stress the importance of document control and records management (See Cornell University's documentation guidance on page III-84.
- Check out paper vs. electronic options.
- Try web-based electronic products and ask your colleagues if they can recommend products.
- Focus on records that add value – avoid bureaucracy. If records have no value, do not keep them. Make the records that you do keep accurate and complete.
- Use computer systems to maintain records and documents; make records available to employees via a designated computer or via a campus network.
- Consider the need for security. Should access to some records be limited? Should duplicates of some records be maintained elsewhere?
- Establish a records retention policy considering relevant regulatory requirements and stick with it.
- Highlight changes in revised documents to make it easier for readers to identify changes.

Types of Records You Might Maintain

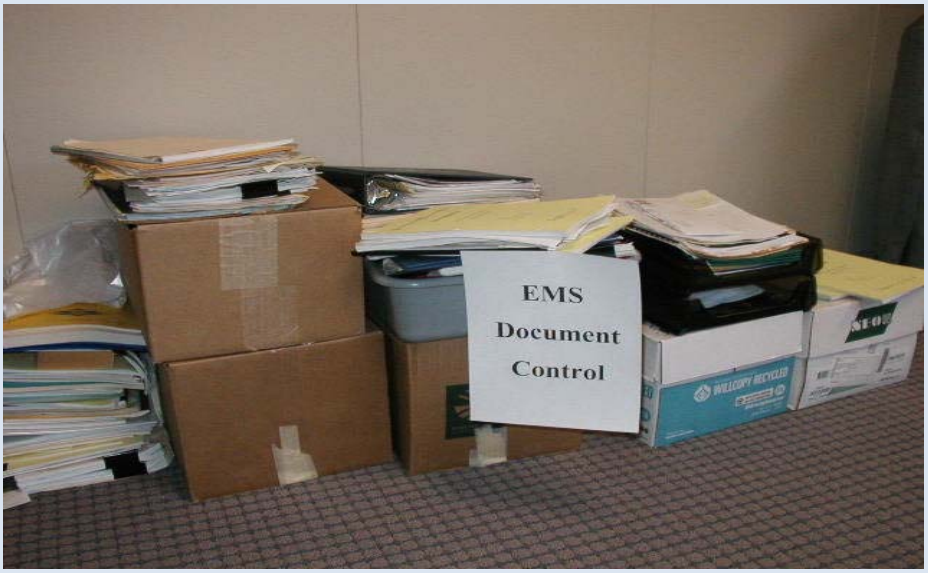
- Legal, regulatory, and other code requirements
- Results of environmental aspects identification
- Reports of progress toward meeting objectives and targets
- Approvals related to permits, licenses, etc.
- Job descriptions and performance evaluations
- Training records
- EMS audit and regulatory compliance audit reports
- Reports of identified nonconformities, corrective action plans, and corrective action tracking data
- Hazardous material spill / other incident reports
- Communications with customers, suppliers, contractors, and other external parties
- Results of management reviews
- Sampling and monitoring data
- Maintenance records
- Equipment calibration records
- Communications records

Types of Documents You Might Control

- Environmental policy
- EMS procedures
- Blank forms used to implement EMS procedures, such as forms for:
  - Environmental Aspects and Impacts Review
  - List of Significant Environmental Aspects
  - Compliance Assessment
  - Environmental Management Programs (for each Objective and targets)
  - Organizational Chart
  - Individual Training Plans
  - Communication Forms
  - Maintenance manuals
- An index of all documents and a distribution list that identifies other personnel who should receive copies of documents

Trap

Don't let this happen to you:



Rich Lemoine, UMass Lowell's EH&S Manager, found his piles of EMS related documents occupying an ever-growing and disorderly corner of his office. He and a graduate student developed an electronic system that eliminated the piles and helped him better manage the EMS process. See http://www.uml.edu/ems or contact richard_lemoine@uml.edu.

SAMPLE EMS DOCUMENT CONTROL INDEX

(Adapted from *Environmental Management Systems: An Implementation Guide for Small and Medium-sized Organizations*, NSF International, 2001)

Document	**Location of Controlled Copies**	**Review Cycle**	**Name of Author and Date of Revision**			
			1	**2**	**3**	**4**
Environmental Policy	1-EMS Manager 2-President Uncontrolled copies posted on all building lobby bulletin boards	Annual	John Smith EMS Manager 1/1/99	John Smith EMS Manager 1/1/00		
EMS Procedures: Environmental Aspects Compliance Objectives & Targets Roles and Responsibility Communications Training EMS Document Control Emergency Response & Preparedness Measurement & Monitoring EMS Nonconformance Corrective and Preventative Action for Compliance	1-EMS Manager only	Annual	John Smith EMS Manager 1/11/99	John Smith EMS Manager 1/21/00		

Document	Location of Controlled Copies	Review Cycle	Name of Author and Date of Revision			
			1	2	3	4
Records Audits Administration Review						
Standard Operating Procedures Facilities Maintenance Vehicle Maintenance Waste Water Plant	1-EMS Manager 2Facilities Manager	Annual	Art Johnson-Facilities Manager 2/15/99	Art Johnson-Facilities Manager 2/28/00		
Compliance Assessment Protocol	1-EMS Manager only	Annual	AAA Envir. 6/15/99	AAA Envir. 6/1/00		
Communication Forms (Blank)	1-EMS Manager only	Annual	Barb Hall EMS Spec 2/1/99	Barb Hall EMS Spec 2/25/00		
EMS Audit Protocols	1-EMS Manager only	Annual	John Smith 1/11/99	John Smith 1/21/00		
Other related documents (list separately, e.g. SPCC Plan, Emergency Response Plan, etc.).	1-EMS Manager only	Annual	Barb Hall EMS Spec 2/1/99	Barb Hall EMS Spec 2/25/00		
Other forms and checklists (list)	1-EMS Manager	As Needed				

SAMPLE PROCEDURES

EMS Document Control (page III-84) describes an example of how EMS documents should be controlled. To that end, this element includes a "Sample EMS Document Control Index" that can be used as a starting point to develop a means for tracking the generation, distribution, age, and most recent version of all controlled documents.

The Records Management procedure (page III-85) is for the identification, management and disposition of records.

EXAMPLES OF PROCEDURES

Examples of Document control procedures include:

- http://www.ehs.wsu.edu/esrp490/documentcontrol.htm
- http://www.orcbs.msu.edu/environ/programs_guidelines/ems/procedures/System%20Doc.%20and%20Doc.%20Control.pdf

An example of a records control procedure can be found at:

http://www.ehs.wsu.edu/esrp490/recordmanagement.htm

CORNELL UNIVERSITY	Cornell Management System for Safety, Health and the Environment	Guidance Document
Guidance Title SHE Documentation Guidance Do>Documentation & Document Control>Documentation Guidance	Document Number CMS-G-001	Unit Cornell EMS

1.0 PURPOSE

This guidance document describes the functional framework to determine documentation needed for ensuring safety, health and environmental performance.

2.0 SCOPE

This guidance is inclusive of all documents that are directly associated with managing safety, health and environmental requirements and performance applicable to the Cornell EMS.

3.0 RESPONSIBILITIES

Ensure appropriate documentation exists to meet safety, health and environmental requirements.

4.0 GUIDANCE AND EXPLANATION

DOCUMENTATION

Documentation is valuable in answering three important questions for safety, health and environmental performance:

- What are the requirements?
- How does the organization meet the requirements consistently?
- What is the proof?

Three, or more, tiers of documentation can address these questions.

1. Policies, regulations, or other requirements articulate what is necessary for safety, health and environmental performance and define expectations of appropriate parties.

2. Operational Controls ensure steps to meet those requirements are in place and completed consistently.

3. Records provide evidence that the requirements have been met.

When processes are documented, it is easier to understand how things are done and to measure performance.

Documentation may exist in a variety of forms: policies, procedures, plans, posters, flowcharts, checklists, etc. It is helpful to consider the tiers of documentation and how they are related to each other. Figure 1 is a tool to assist in structuring documentation within an organization or a program.

For individuals managing activities with safety, health or environmental considerations, tiered documentation outlines how the requirements are met.

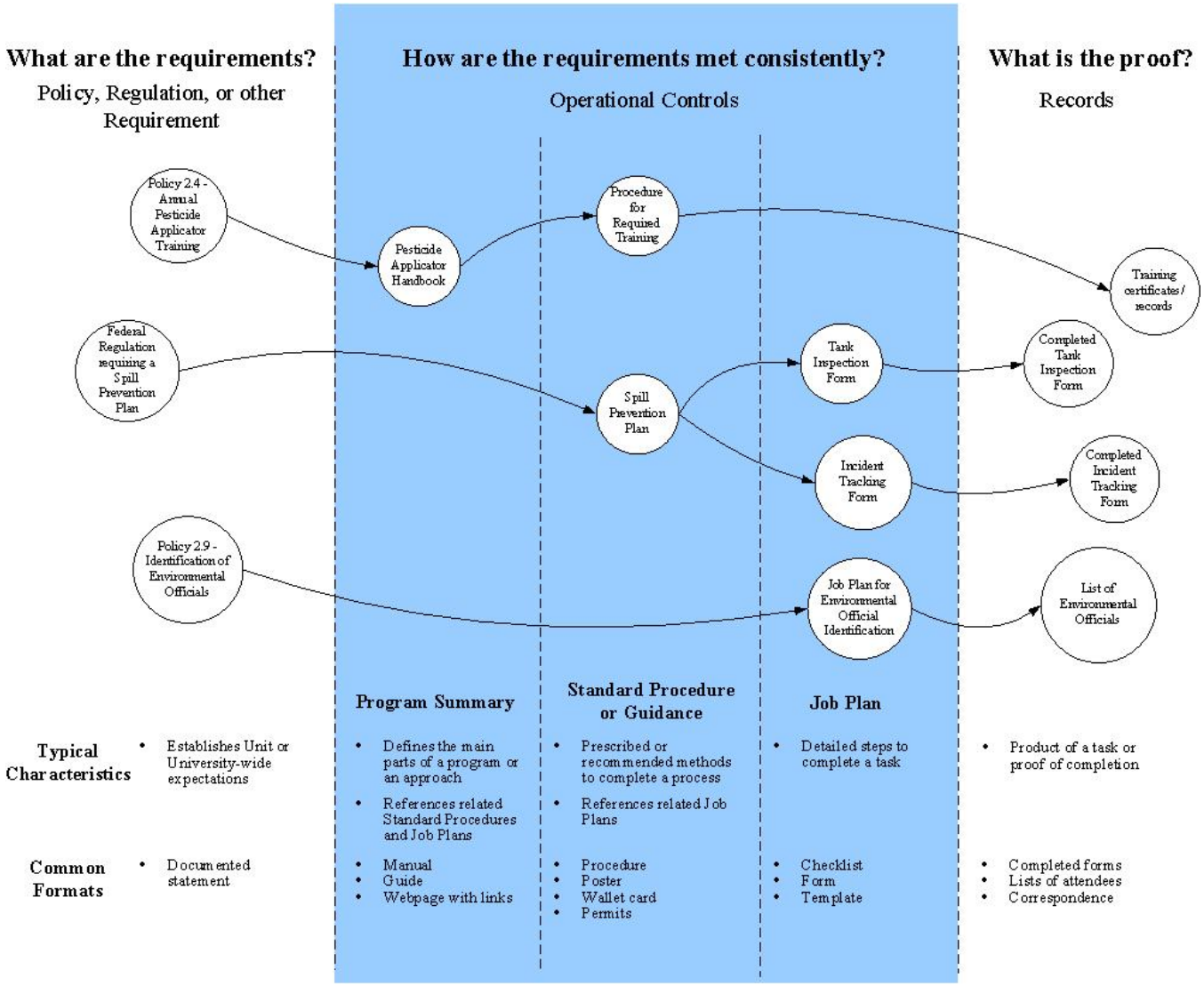


Figure 1: Tiers of Documentation

POLICY, REGULATION OR REQUIREMENT:

The policy, regulation, or other requirement is the reason a process, task, or activity is carried out. A policy or a requirement is the answer to, "Why is it important to do this?" This documentation may include University-wide policies, unit policies, regulations, requirements mandated by the federal, state, or local authorities, etc.

OPERATIONAL CONTROLS:

Each Unit or Program needs to have consistent and accurate methods of meeting the requirements. The tools organizations have in place to ensure consistent performance between policies or requirements and records are called operation controls. These may take the form of a standard procedure, a job plan, an instructional poster near a machine, a checklist, a form, etc. In other words, operational controls are the answers to the question, "How does the organization meet the requirements consistently?" In instances where the procedure for completing a task is not documented, it is recommended that the steps are

captured in some format in order to ensure the same result each time the activity is completed.

RECORDS:

Records are the proof or evidence that the organization is meeting the requirements. They demonstrate that the necessary measures have been taken to adhere to a requirement or policy. Records often take the form of a completed form or checklist, a training certificate, a list of attendees, or a database of inspection records, etc.

5.0 REFERENCE

Cornell University Policy 4.7, Retention of University Records

[College/University Name]	EMS Procedure	3.4
	Effective Date	
	Subject	EMS Document Control

Purpose This procedure governs [EMS/project] document control and ensures that faculty and staff understand and have access to current terms, guidance, procedures and documents.

Step 1 The [EMS Manager/Sustainability Director…] is responsible for [EMS/project] document control. Controlled [EMS/project] documents may include the following:

- [List for your college or university]

Step 2 The controlled [EMS/project] documents listed in Step 1 will be designated by headers and/or footers with the following:

- Effective date
- Approval signature and date
- Copy number
- [List any other information you want to be sure is on your documents to help to track them]

Step 3 The [EMS Manager/Sustainability Director…] will maintain a document control index of all documents and a distribution list that identifies other C/U personnel who should receive copies of [EMS/project] documents.

Step 4 The master copy of the controlled [EMS/project] documents listed in Step 1 will be maintained under the control of the [EMS Manager/Sustainability Director…] or their designee. The [EMS/project/Sustainability] team member signing the current version of controlled documents will be responsible for distributing new, and collecting obsolete documents.

Step 5 The index of controlled [EMS/project] documents will be updated whenever one of the documents is revised.

Responsible Person:	
Signature and Date:	

[College/University Name]	EMS Procedure	4.4
	Effective Date	
	Subject	Records

Purpose This procedure is used to maintain [EMS/project] records.

Step 1 The [EMS Manager/Sustainability Director…] and other personnel selected by the [EMS Manager/Sustainability Director…] are responsible for identifying records that are maintained by the campus as part of the [EMS/project].

Step 2 The [EMS Manager/Sustainability Director…] and other personnel will maintain a document index of

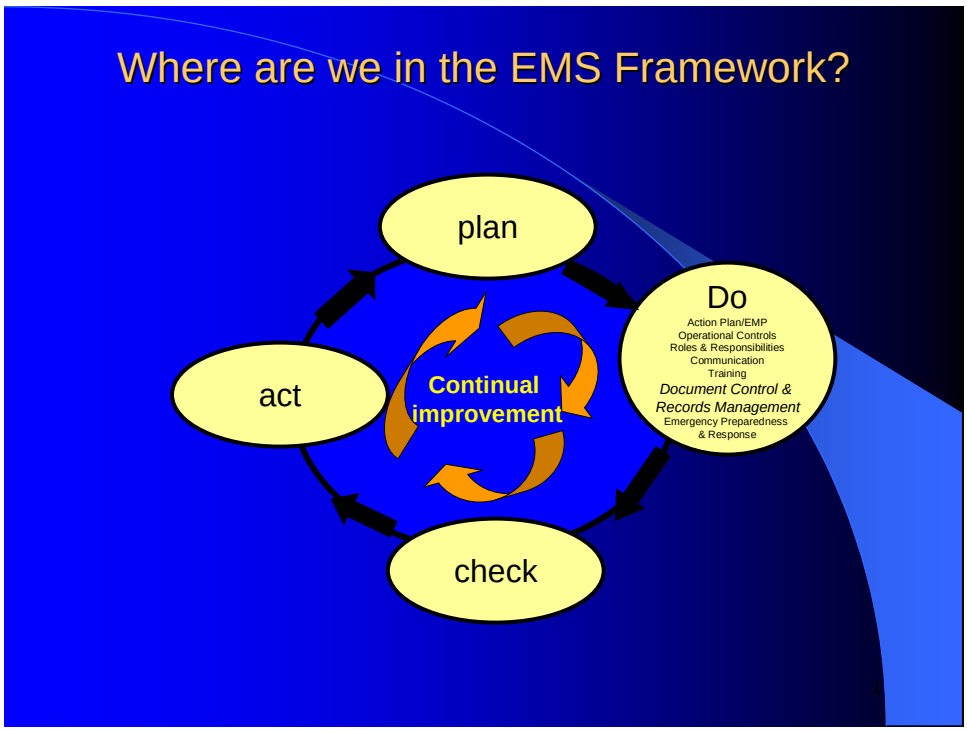
- all data required,
- persons responsible,
- location, and
- length of retention.

Step 3 The [EMS Manager/Sustainability Director…] and other [college/university name] personnel will identify and note on the document index any restrictions on records necessary for security.

Step 4 The [EMS Manager/Sustainability Director…] and other [college/university name] personnel will review the records and purge obsolete records at least every [insert time frequency appropriate for your [college/university name] and circumstances].

Responsible Person:	
Signature and Date:	

TIME TO PAUSE AND CHECK IN



The above figure shows where Document Control and Records Management fits in the management system cycle. 'Emergency Response and Preparedness' is discussed next.

BEFORE GOING ONTO THE NEXT SECTION, ASK YOURSELF:

- ☐ ***Document Control:*** Do we have a system in place for 'controlling' the documents associated with our EMS or Sustainability Initiative?
- ☐ ***Records Management:*** Have we identified the records we need to manage? Do we have a procedure for managing them?

WHAT'S NEXT?

1. Continue on in building the management system by developing:
   - Emergency Response and Preparedness (How do we respond to and prepare for potential emergencies?),and
   - Phase IV (Check and Act).

EMERGENCY PREPAREDNESS AND RESPONSE: HOW DO WE PREPARE FOR AND RESPOND TO POTENTIAL EMERGENCIES?

All colleges and universities have experienced an event that required some kind of emergency response and most have suffered numerous events both large and small. Unfortunate events such as an employee injury, a spill of hazardous chemicals, or a fire do occasionally occur. With colleges and universities typically using a wide variety and quantity of hazardous chemicals, biological and radiological materials used by a wide range of faculty, students, and staff, the potential for incidents is high.

Post 9/11 security concerns have increased dramatically. Institutions of higher learning have to be vigilant in planning and preparing for emergencies.

Helpful Documents for Gauging Emergency Risk and Making Preparations

- Site maps to determine relative locations of hazardous, biological or radiological materials and waste to people and environmentally sensitive areas
- Drainage plans, including surface and subsurface conveyances
- Past records and reports of emergencies and any rectifying actions taken
- Existing procedures, response plans, lists of contacts
- List of significant aspects

It should be noted that as concerns have increased, so have the expectations by parents, students, faculty and the community that colleges and universities are doing all they can to ensure their safety and well-being.

What is it? This element includes:

- Planning for potential emergency situations that arise from everyday activities and executing preventive actions.
- Developing procedures and putting them in place to respond to emergencies.
- Having methods to revisit the emergency plans after an incident and to make any needed improvements (corrective action).

What purpose does it have? Emergency planning can help identify your areas of risk, limit the severity of injuries that can occur; protect faculty, students, staff, neighbors and the environment; reduce asset losses; and minimize damage to an institution's image.

What's in it? An effective emergency response and preparedness program should include provisions for:

- Assessing the potential for accidents and emergencies
- Taking steps to minimize the risk of or prevent incidents and associated impacts
- Training drills to assure competency
- Coordinating with off-campus and on-campus first responders

A management system helps you PREVENT incidents before they occur, not just respond to them.

- Responding to incidents, and
- Mitigating impacts associated with these incidents

What does it make possible? Having a plan (and testing it!) increases your college or university's ability to respond to and manage an emergency situation. Identifying and addressing potential hazardous situations reduces risk.

Why do we need it? Being prepared for and being able to respond to incidents reduces the chance of harm, delayed and inadequate response, and costs.

Why do we need a procedure? Having a procedure helps ensure that the plans are reviewed, tested out, revised and implemented on a regular basis.

When should we develop it? Every college or university has some kind of emergency preparedness and response plan. However, it is a good idea to revisit your plans, review them, test them out through desktop or field drills, and make any needed changes in procedures, communications, training, equipment, etc.

STEPS TO DEVELOP EMERGENCY PREPAREDNESS AND RESPONSE PLANS

Often, the most difficult part of developing emergency preparedness and response plans is identifying the potential for accidents and emergencies. The person with designated responsibility for this task should form a team composed of personnel (and outside consultants or local responders if necessary or beneficial) to examine all campus activities, particularly those associated with your significant aspects and impacts. Extend your evaluation beyond those materials and operations that are obviously or inherently dangerous; ask "what if" questions under both normal and abnormal conditions.

1. Identify the potential for emergency situations and accidents of all kinds. Use the Emergency Preparedness worksheet (page III-90) to help assess events and relative risk. Revisit the list of legal and other requirements to see what regulations require emergency preparedness and/or response plans. Revisit your aspects and impacts analysis to see where you have identified potential for significant impacts. Include relevant requirements, significant impacts and events in the worksheet, and list your existing plans.

2. Pay particular attention to the potential environmental impacts of accidents and emergency situations, identify how your institution can prevent and

Overlapping Emergency Response Requirements

Various federal programs require some sort of emergency response plan, hazard evaluation or risk assessment, for example:

- RCRA
- Oil Pollution Act of 1990
- SPCC
- EPCRA
- Hazard Communications 29 CFR 1910.120
- OSHA

mitigate associated adverse environmental impacts.

3. Determine, document, and communicate how employees, students, faculty, and administration should respond to emergency situations and accidents. Include existing plans and requirements you have in place.

4. Test your preparedness through drills and other mechanisms to test response capabilities. Check your preventive measures to be sure they are in place and operational. Document your tests and evaluate your performance. Provide feedback to all involved.

5. Use your drills to continuously improve your response. Review and revise procedures based on experience from actual or simulated emergency situations and experiences[45].

EXAMPLES OF TOOLS

Examples of documents or intranet tools that support a college or university's ability to be prepared for and respond to emergencies include:

Boston University's 'Emergency Flip Chart':
http://www.bu.edu/ehs/emergency/index.html?faq=emergency%20response

Emergency Plan: http://www.bu.edu/ehs/emergency/emergency-response-plan.html?faq=emergency%20response

and Emergency Preparedness:
http://www.bu.edu/ehs/emergency/preparedness.html?faq=emergency%20response

EPA'S INTEGRATED CONTINGENCY PLAN

U.S. EPA has developed guidance intended to be used by facilities to prepare emergency response plans that consolidate multiple plans to comply with various regulations. This guidance is for an "Integrated Contingency Plan" covering oil and non-radiological hazardous materials. The guidance can be accessed at the EPA website:
http://yosemite.epa.gov/oswer/ceppoweb.nsf/content/sta-loc.htm#OnePlan
The National Response Team's Integrated Contingency Plan Guidance (One Plan)(Corrected Version) (wpd/266 KB) provides the guidance within a federal register notice.

[45] Adapted from *ISO 14001 Implementation Handbook,* James H. Schaarsmith, p.81.
http://www.deq.state.va.us/veep/pdf/isoguide.pdf

EMERGENCY PREPAREDNESS AND RESPONSE WORKSHEET[46]

POTENTIAL ACCIDENT AND EMERGENCY SITUATIONS

List the potential accident and emergency situations likely to occur within your institution, their probability of occurrence in a one-year time period, and your best estimate of economic damages from the occurrence; last, multiply Column 2 by Column 3 and enter the result in Column 4:

NOTE: The list in the left hand column includes examples only; adjust to fit your institution.

1. Potential Accident or Emergency Event	**2. Likelihood of Occurrence in One Year**	**3. Best Estimate of Damages (injuries, economic, harm to environment)**	**4. Columns 2x3=Relative Value of Accident or Emergency in One Year**
Fire or explosion			
Release of hazardous material			
Chemical spill in laboratory			
Release of biological agents in laboratory			
Release of radiological material in laboratory			
Tornado			
Hurricane			
Flood			
Blizzard			
Power Outage			
Bomb threat			

Rank of Potential Accident or Emergency Situations (in order of highest to lowest from Column 4)

1. _____
2. _____
3. _____

[46] *Ibid.*, p. 86.

4. _____
5. _____
6. _____
7. _____
8. _____
9. _____

ASSOCIATED ENVIRONMENTAL IMPACTS

For each potential accident or emergency situation identified in the preceding list, use the following table to identify any associated environmental impacts, determine what can be done to prevent the occurrence of the environmental impacts, and/or what can be done to mitigate the environmental impacts:

Ranked Potential Accident or Emergency Situation	Associated Environmental Impacts	Preventive Actions	Mitigative Actions
1.			
2.			
3.			
Etc.			

REVIEW AND REVISION OF THE EMERGENCY RESPONSE PROCEDURES

Review and revise your Emergency Response Procedures to give appropriate attention to potential accident or emergency situations.

SAMPLE PROCEDURE

[College/University Name]	EMS Procedure	3.5
	Effective Date	
	Subject	Emergency Response and Preparedness

Purpose This procedure is used to anticipate, document, prepare for, and review preparedness plans and emergency events.

Step 1 The EMS Manager, EH&S Office, Campus Security Office, and other participants selected by the EMS Manager and/or by the [insert college/university upper level person] are responsible for identifying dangers, taking proactive steps to prevent emergency incidents, and completing tasks in preparation for emergencies.

Step 2 The EMS Manager will prepare and update an Emergency Response Plan that contains all emergency procedures required by local, state and federal regulatory agencies.

Step 3 The EMS Manager will familiarize and train appropriate faculty, students, staff, and emergency coordinators on the procedures described in the Emergency Response Plan. [note that this responsibility may devolve to other emergency personnel on campus, and the EMS Manager may have more of a coordinating/participating role].

Step 4 For each emergency incident, the EMS Manager and the emergency coordinators will determine the cause of the emergency, evaluate the response to the incident, and identify actions to be taken to minimize its recurrence.

Step 4 At least twice per year, the EMS Manager and other EMS Participants will review the Emergency Response Plan and any emergency incidents that occurred since the last review.

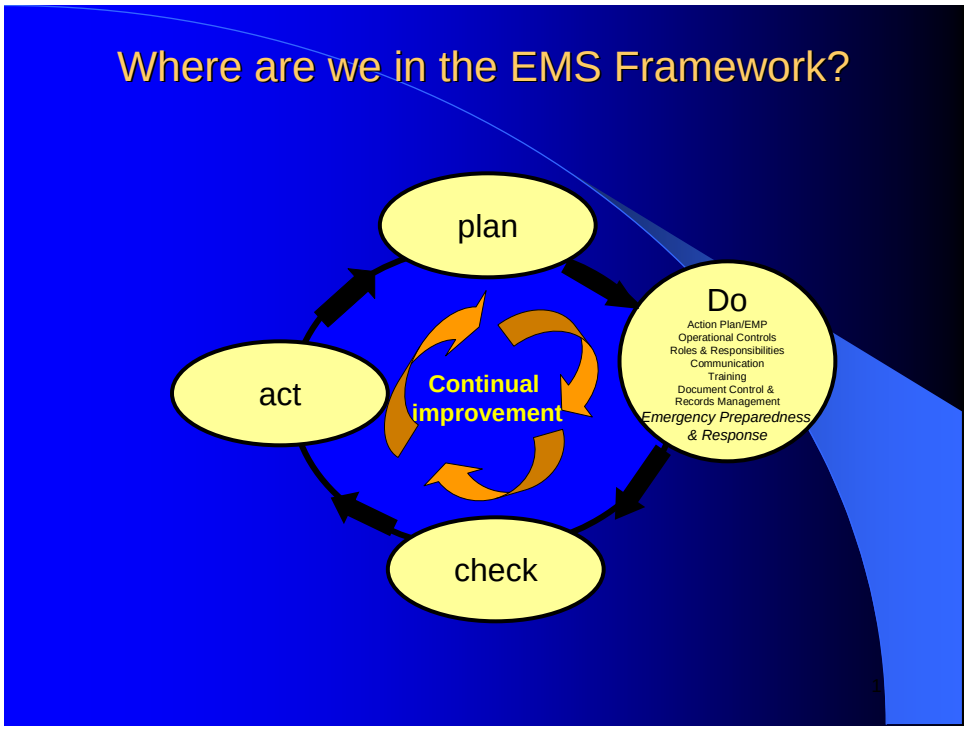
Step 5 Documentation concerning emergency response and preparedness and emergency incidents will be retained at [college/university name] for at least 5 years.

Responsible Person:	
Signature and Date:	

EXAMPLES OF PROCEDURES

Examples can be found at: http://www.ehs.wsu.edu/esrp490/emergencyresponse.htm

TIME TO PAUSE AND CHECK IN



The figure above shows where 'Emergency response and Preparedness' fits in the management system cycle. Phase IV (Check and Act) is discussed next.

BEFORE GOING ONTO THE NEXT SECTION, ASK YOURSELF:

- ☐ ***Emergency Preparedness:*** Do we have procedures, plans, training, equipment, and communication mechanisms in preparation for an emergency? Do we test/audit our preparedness? Do we look for root causes after incidents to identify actions that can be taken to prevent future incidents?
- ☐ ***Emergency Response:*** Do we respond appropriately in emergency situations? Does everyone on campus know who to call?
- ☐ ***Documentation:*** Do we have written notification and emergency response procedures? Do we have written procedures where required by regulation?
- ☐ What's working well in how we are developing our project, EMS or Sustainability Initiative? What could be improved? Write down 3 things you will continue to do and 3 new things you will try.

WHAT'S NEXT?

1. Use the emergency response and preparedness procedures to improve your college or university's capability to be prepared for emergency situations.
2. Continue on in building the management system by Checking and Acting (Phase IV).
3. Before moving to 'Phase IV; Check and Act', take a few minutes to see how far you've come and what challenges still exist. You can do this in several ways:
    a. Check in on the original project scope, developed in the 'Getting Started' phase to (a) see how you've done in accomplishing what you said you were going to; (b) see if any adjustments are needed to the timeline, milestones, and resource needs; and (c) keep the Team focused and motivated.
    b. Write down what 'success' might look like in 3 months.
    c. If you completed a Gap Analysis (Phase I-18) or the C2E2 'crosswalk' (Phase I-24), go back and redo them to see what changes have occurred. You will most likely be surprised at how much has changed.

PHASE IV: CHECK AND ACT

Colleges and universities use different methods to check how students are doing in meeting their commitments to their classes and overall education (e.g., meetings with professors and teaching assistants, homework assignments, pop quizzes, mid-term exams, final exams, meetings with advisors). This is done to make sure that the students are on track, that the curriculum is working, and to identify what additional assistance or interventions might be needed.

Similarly, your college or university makes policy commitments to compliance, prevention of pollution, continual improvement, and sustainability. You plan, develop and implement actions and procedures to meet certain goals. How are you able to know they are working?

The elements in this phase answer these questions by checking back to see how you are doing in meeting your environmental and sustainability goals. It includes:

- **Monitoring and Measuring Performance:** How well is the system working? Are we making progress towards meeting our goals?
- **Non-conformance, corrective action, preventive action** (page IV-11)**:** How do we find and fix problems so they don't happen again?
- **Audit** (page IV-24): Are we doing what we said we would?
- **Administration Review** (also referred to as 'Management Review) (page IV-34)**:** What do we need to do to improve? Is the Administration (or department head) aware, engaged and committed?

MONITORING AND MEASURING PERFORMANCE:

HOW WELL IS THE SYSTEM WORKING? ARE WE MAKING PROGRESS TOWARDS MEETING OUR GOALS?

"If you can't measure it, you can't manage it." —Deming Principle

"Value what you measure; measure what you value."

What is it? Measuring, monitoring and evaluating are activities that let you know whether your college or university is making progress in meeting its compliance, environmental and sustainability goals.

What purpose does it have? Monitoring and measurement help you[47]:

- Evaluate environmental performance or movement towards sustainability
- Analyze root causes of problems
- Assess compliance with legal requirements

[47] *Environmental Management Systems: An Implementation Guide for Small and Medium-Sized Organizations*, p. 60.

- Identify areas requiring corrective action
- Obtain resources (because you are able to better understand and document problems or opportunities)
- Improve performance and increase efficiency

What's in it? Key indicators of compliance are performance in meeting goals, functioning of equipment, operations and activities.

What does it make possible? Communicating the results helps you keep up momentum, get 'credit' for improvements or cost savings/avoidance and celebrate accomplishments. Results are also used to decide what further actions should be taken.

Why do we need it? Without monitoring and measurement, you don't know how well you're doing in terms of compliance, environmental performance or sustainability. You also don't know how well the system of procedures and policies is working.

When should we develop it? After objectives and targets are created, specific parameters must be identified and periodically measured to track progress toward the objectives and targets. (Also see Cornell University's fact sheet on Objectives and Targets included in Phase II) As an example, if a high priority ('significant') aspect were campus-wide energy use with an objective and target of "10 percent reduction in 12 months", the parameter you might measure could be kilowatt-hours consumed annually, preferably normalized on a per capita or square foot basis.

It is strongly suggested that you begin thinking about monitoring and measuring as early as possible. You can begin when you collect baseline information to help the Team decide what areas the EMS or Sustainability Initiative might include.

Why do we need a procedure? Again, a procedure gives a standard set of instructions on how you want to measure and monitor the impacts of your operations on the environment. Without consistency in method or frequency, you will not be able to use the information effectively to assess and evaluate progress and/or needs.

Where possible, we display information simply and visually via graphs that show trends over time and the goals.

Laurie Cecere
EMS Manager
Cornell University

STEPS TO MONITOR AND MEASURE PERFORMANCE[48]

1. Your Action Plans/EMPs and operational controls should have measurement associated with them. As a first step, review the types of monitoring you do now (e.g., associated with operational controls, EMPs, regulatory compliance, purchasing, training, energy or water conservation). Do you need additional monitoring and measurements?

2. Define measures that mean something to your team and institution. (See target-specific metric below.)

3. Based on the information you have from Step #1, combined with your policy and goals, define or list what you need and review how the information will be used.

4. Identify key equipment associated with measuring your objectives; include calibration as well as other monitoring equipment.

5. Prioritize your list of the measures you want to obtain: start simple and adjust as needed. (Note budgetary needs associated with equipment needed for priority measures, if necessary.)

6. Refine your measurement strategy as you develop your systems. Use your communications plan to communicate what you find and learn.

Worksheet

The worksheet on page IV-7 can help you identify measurements while establishing operational controls and identify training needs at the same time.

Tips

1. Establishing baselines and monitoring programs can be especially difficult on college and university campuses. In some cases, a single department may not have complete control over an aspect, such as energy use, which makes measurement and monitoring particularly challenging. In these instances, it is important to make regular reporting a standard operating procedure and assign responsibilities.

2. Measuring and monitoring programs are also a good area to utilize student interns; they can help to identify parameters, establish baselines, and maintain an established monitoring program (data collection and charting).

3. Set up your monitoring program so that your can track trends over time. This will help you display the information simply and visually.

[48] *Environmental Management Systems: An Implementation Guide for Small and Medium-Sized Organizations*, p. 60.

I am a firm believer that indicators and benchmarks for success are imperative to measuring sustainability at any institution. If you don't know where you stand in areas such as energy use, green purchasing, waste reduction, etc. how will you ever move forward and accurately evaluate your progress?

Tavey McDaniel
Sustainability Outreach and Communication Coordinator
Duke University

Traps to avoid:

1. **Collecting data for data's sake:** Collect data to use it, not just to collect it.
2. **Thinking that if it's not perfect data we can't use it:** Again, the intended use of data dictates how good the information has to be.
3. **Developing a whole array of indicators, publishing a report, and then never reporting again:** Better to report on fewer measures and to do it consistently over time.
4. **Not normalizing the data:** Information needs to mean something. On a campus that is always building, renovating and going through changes, measures mean little if they are not normalized either per capita (students and/or workers) or by area.

TARGET-SPECIFIC METRICS

Target-specific metrics are unique to your college or university's objectives and targets. Examples of metrics that relate to common objectives and targets are listed below.

- Energy use from on-campus dormitory lighting (See Energy Star at http://www.energystar.gov/index.cfm?c=higher_ed.bus_highereducation)
- Water use in recreational and athletic facilities (See Water Sense at http://www.epa.gov/owm/water-efficiency/index.htm and additional information at http://www.energystar.gov/index.cfm?c=business.bus_water)
- Number of buildings designed or rehabilitated to LEED (US Green Building Council) standards
- Monthly volume of halogenated solvents used by chemistry department laboratories

Since all colleges and universities use water and energy, conservation of those two resources is a common target. Because they are consumed in so many ways, target-specific metrics should be defined in a way that can be easily measured and monitored. Laboratory-generated wastes are another common target, and should be more easily measured because of regulatory compliance records.

- Monthly use of or replacement of cleaners containing toxic chemicals with non-toxic floor substitutes by

janitorial operations

- PC and HVAC energy consumption from campus computer laboratories
- Monthly volume of pesticides used on campus for vector control in buildings, Integrated Pest Management
- For campus with building/renovation projects, tons of construction debris or waste concrete land-filled per quarter

CAMPUS METRICS

Typical campus metrics that together provide at-a-glance information about environmental performance are identified in the table below and may be used to understand your institution's footprint and to benchmark against other colleges and universities. Remember that these are only sample metrics. Choose at least one metric that is appropriate to each of your individual objectives and targets.

Examples of Campus Metrics

Metric	Notes
Energy use (electricity, natural gas, or other power source)	***Use of information:*** Estimates equivalent CO_2 emissions, an institution's contribution to greenhouse gases (GHGs), and results of conservation practices. ***Examples of normalized data:*** Consumption adjusted for degree-days and indexed to square feet; kWh per building when separately metered.[49] Renewable energy generated on campus; renewable energy purchases as a percent of total purchases or per student.
Water use	***Use of information:*** Estimates wastewater generation, results of conservation practices, and pesticide and fertilizer runoff associated with landscaping. ***Examples of normalized data:*** Aggregate water use per capita, per laboratory, or per research dollars.
Laboratory hazardous wastes (chemical, radiological and biological)	***Use of information:*** Estimates hazardous waste generation (including) from laboratories, results of waste minimization efforts. Also used in compliance reporting and to conform with security requirements. **Examples of normalized data**: Aggregate per student or per laboratory.
Janitorial chemicals	***Use of information:*** Estimates the effects of environmentally preferred purchasing initiatives. ***Examples of normalized data:*** % of total cleaning products that are environmentally preferable.
Solid Waste (paper, food, and 'end-of-year' furniture, clothes, etc.)	***Use of information:*** Estimates generation of solid waste, effect of reduction, reuse, and recycling practices. ***Examples of normalized data:*** Pounds per capita, pounds per number of meals served, pounds per dormitory room.

[49] *Implementing the ISO 14001Environmental Management System Specification, Version 2.0.* James H. Schaarsmith, p. 61 http://www.deq.state.va.us/veep/pdf/isoguide.pdf

Examples of Campus Metrics	
Metric	**Notes**
Computer/E-waste	***Use of information:*** Estimates the effect of reduction, reuse, and recycling practices. ***Examples of normalized data:*** Aggregate pounds or cubic yards per faculty population. ***Other example:*** Pounds or percent of used computers sent to populations in need.
Construction- and renovation-associated wastes	***Use of information:*** Estimates the effects of efforts to require contractors to implement requirements to reuse and recycle materials. ***Examples of normalized data:*** Pounds demolition material recycled per square foot of project. ***Other example:*** Green buildings constructed (LEED level).
Vehicle fuel and chemical use Alternative fuel vehicles	***Use of information:*** Estimates the effects of conservation efforts to reduce fuel and chemical use of trucks, passenger vehicles, buses, and construction and landscaping vehicles. ***Examples of normalized data:*** Improvement in mileage per gallon on vehicles (per department); pounds of compost recycled and used per acre in comparison to pounds of pesticides used. ***Other example:*** Percent of vehicles converted to alternative fuel vehicles.
Compliance	***Use of information:*** Measures compliance performance. ***Examples:*** Number, type and seriousness of violations cited in regulatory inspections Number of internal or third party audits conducted Number, type and seriousness of violations observed in internal or third party audits Number of repeat violations observed Timely completion of items listed on the Compliance Calendar
EMS Conformance	***Use of information:*** Assesses whether you are operating as the EMS says you will. ***Examples:*** Number of EMS awareness and training sessions conducted; number of attendees Completion of internal EMS audits Number, type and seriousness of non-conformances observed in EMS audits
Sustainability measure of social/economic impact	***Use of information:*** Estimates support of local economy. ***Example of normalized data:*** pounds of produce purchased locally per meal or vs. pounds purchased form >250 miles away; dollars spent on local products per total dollars spent. Employment of local populace as a percentage of total employment. ***Other examples:*** http://csap.envs.wmich.edu/media/Snapshot%20Indicators%20040510.pdf

.

Worksheet on Operational Controls and Monitoring and Measurement[50]

Significant Aspect example	Associated Operations example	Operational Controls examples	Key Characteristics of Operations example	Measurement examples	Training Needs examples: Who would need to be trained on your campus?
1. Electric power use	Production	Operating procedures that optimize power use Use of renewable generation methods	KWh use	KWh/student	e.g. facilities
	Facility heating/ cooling	Operating procedures to maintain temperature at predetermined levels	Combined thermal /electric energy use	Energy units/ degree day	e.g. facilities, students in dormitories
	Office equipment and lighting	Management directive on electric energy efficiency Use of only energy star products, compact fluorescent light bulbs	KWh use	KWh/month	e.g. facilities, administrative personnel
2. Solid waste	Administration	Management directive on efficient use of paper	Paper use	Paper use/student and/or employee % recycled	e.g. administrative personnel, faculty, students, information technology staff
	Food services	Operational procedure to separate recyclable and compostable waste Directive on not using disposables	Food waste Solid waste	Kitchen waste/diner	e.g. food services, cafeteria patrons
	Shipping/receiving	Operating controls to minimize, reuse, and recycle packaging materials	Packaging materials	Lbs. Corrugated/month; # of pallets,	e.g. facilities

[50] Adapted from *Implementing the ISO 14001 Environmental Management System Specification, Version 2.0.* James H. Schaarsmith, p.63. http://www.deq.state.va.us/veep/pdf/isoguide.pdf

Significant Aspect example	Associated Operations example	Operational Controls examples	Key Characteristics of Operations example	Measurement examples	Training Needs examples: Who would need to be trained on your campus?
3. Hazardous materials	Production	Operational procedures aimed at minimizing VOCs	Cleaning solvent use	Gallons solvent/year	e.g. laboratory workers, supervisors, primary investigators
	Teaching laboratories	Operational procedures to track purchasing Curriculum changes to incorporate 'green chemistry' techniques	Chemical use	Volume/student/year	e.g. faculty, students, administration purchasing personnel
	Janitorial	Operational procedures to control the number and type of toxic cleaning supplies used	Cleaning supplies	# of environmental preferred products as % of total cleaning supplies	e.g. custodial staff, facilities
	Grounds	Maintenance contract to minimize the amount of fertilizers and pesticides used or use of compost	Fertilizer, pesticide use	Lbs. Fertilizer and/or pesticide replaced with environmental preferred products #s compost/acre	e.g. custodial staff, facilities, contractors
4. Stormwater runoff	Parking lot	Operational procedures to control and monitor runoff	Runoff containing hydrocarbons, sediments	Runoff quality	e.g. custodial staff, facilities, contractors
	Roof	Procedure to incorporate 'Green roofs' in designing new or rehabbed buildings.	Runoff not directed to impermeable surfaces.	Runoff volume.	e.g. campus planners, custodial staff, facilities, contractors
5. Air emissions	Painting	Operational controls to minimize use of paints containing HAPs	Paints containing toxic chemicals	Lbs/year % of total purchases/yr	e.g. custodial staff, facilities, contractors, faculty, students
	Painting	Contract specifications to contractors to use low-VOC paints	Indoor air pollution form paints	Lbs/year % of total purchases/yr	e.g. administration purchasing personnel, custodial staff, facilities, contractors

SAMPLE PROCEDURE

This procedure describes what parameters will be tracked, how often, and by whom

[College/University Name]	EMS Procedure	
	Effective Date	
	Subject	Measurement and Monitoring

Purpose This procedure is used to implement a measurement and monitoring program designed to support the EMS and specific EMS objectives and targets.

Step 1 The EMS Manager and EMS Team will track campus metrics by collecting and charting data relevant to the metric, including those identified below. The EMS Manager and EMS Team will identify and measure unique parameters for each EMS objective and target. Measurement of the following metrics will be tied in with operational controls (see sec._).

Campus Metric	Data Collection Frequency	Responsibility
Energy Use		
Water Use		
Laboratory Hazardous Wastes		
Janitorial Chemicals		
Computer/IT Wastes		
Construction- and Renovation-associated Wastes		
Vehicle and Fuel Chemical Use		
Compliance		
EMS Conformance		
Accomplishment of Objectives and Targets		

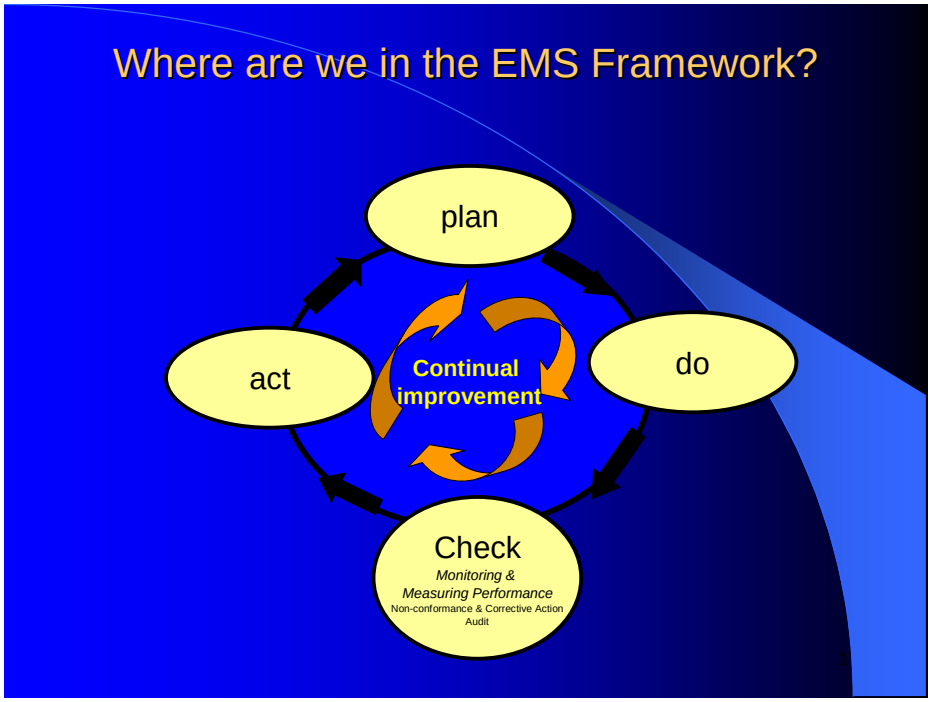
Step 2 The EMS Manager and EMS Team will review campus and target-specific measurement and monitoring data every 3 months to identify trends, evaluate progress toward meeting EMS objectives and targets, and discuss overall environmental performance.

Responsible Person:	
Signature and Date:	

EXAMPLE OF PROCEDURE

An example of a procedure can be found at http://www.ehs.wsu.edu/esrp490/monitoring.htm .

TIME TO PAUSE AND CHECK IN



The above figure shows where 'Monitoring and Measuring Performance' fits in the management system cycle.

'Nonconformance and Corrective Action (How do we find and fix problems so they don't happen again?), Corrective and Preventive Action for Compliance (How de we get back into and stay in compliance?) Audits (Are we doing what we said we would?), and Administration Review (How do we keep learning?) are discussed next.

BEFORE GOING ONTO THE NEXT SECTION, ASK YOURSELF:

- ☐ ***Monitoring and Measurements:*** Have we identified what needs to be measured, communicated and used to make decisions? Have we identified who is responsible, how often it is collected, and who receives the information?
- ☐ ***Documentation:*** Do we have written procedures that ensure that we are collecting and using the information collected?

WHAT'S NEXT?

1. Use the measures and tools to document and communicate your accomplishments and challenges.
2. Use the measures and tools to assess whether the changes you had planned are working.

Continue on to find out if the system you have developed is working the way you wanted it to (through Non-Conformance and Corrective Action, Corrective and Preventive Action for Compliance, Audits, and Administration Review).

NONCONFORMANCE, CORRECTIVE ACTION, PREVENTIVE ACTION: HOW DO WE FIND AND FIX PROBLEMS SO THEY DON'T HAPPEN AGAIN

In the spirit of 'continual improvement', you not only look for what works but also for what parts of the system are not working as originally designed or expected. You are looking for opportunities for improvement and for problems that need to be addressed so that the system will work to achieve your compliance, environmental performance and sustainability goals.

What is it? This step takes the results of an audit (or a finding from an inspection, walk-through, or incident) and 'classifies' the results. It helps translate the findings into action steps to keep your projects and systems up-to-date. It addresses and/or prevents problems in the future while also affirming best practices.

What purpose does it have? There is always room for improvement in any project or system. To check on the system, you need a process to ensure that problems are:

- Identified
- Documented
- Investigated for root causes
- Corrected
- Prevented from happening again
- Tracked (tracking information about problems can help to identify trends that can then be targeted with specific actions).

What's in it? Findings can include:

- ***Observation:*** a best practice that should be highlighted, or a practice that, while not strictly in violation of the management system, could eventually lead to non-conformance.
- ***Non-conformance:*** a deficiency or failure that could adversely affect the EMS or Sustainability Initiative.
- ***Corrective Action/Follow up Request:*** Request to correct the identified problems or to follow up on audit findings.

What does it make possible? In order to make improvements, you need to know where they are needed and the root causes of the problems you are encountering.

Why do we need it? Knowing how your system is functioning or not functioning helps to identify issues that are or could stand in the way of environmental and sustainability goals.

When should we do it? While non-conformances or best practices are identified in an audit, conformance can be evaluated/revised and addressed at any time. Early and frequent identification of issues results in early corrective action and/or affirmation of best practices.

Why do we need a procedure? The procedure documents how a college or university will go about finding and fixing problems and deficiencies in its management system and how to incorporate best practices into common and everyday practices. This can be a sensitive area, and with a written procedure, everyone knows the expectations.

What are typical causes of deficiencies in management systems?

- Inadequate "buy-in" from critical participants such as administration, specific departments/groups
- Over-ambitious scope, schedule, or goals
- Insufficient resources or delegation of responsibility
- Poor communication
- Faulty or missing procedures
- Failure to ensure procedures actually represent existing practices
- System or equipment malfunction due to lack of monitoring or maintenance
- Inadequate training
- Inadequate awareness

STEPS TO DEVELOP A CORRECTIVE ACTION PROCESS[51]

1. PLAN:
    a. Identify the problem/practice (via the process you have designed, e.g., audits and 'walk throughs', or incidents, etc.)
    b. Investigate to identify the root cause and to gather the details
    c. Determine if problem/practice or a similar issue may exist elsewhere
    d. Develop a solution to prevent a non-conformance from reoccurring (or affirm/recognize a good practice)
2. DO:
    a. Implement solution and disseminate the information

[51] Adapted from *Environmental Management Systems: An Implementation Guide for Small and Medium-Sized Organizations*, p.65.

b. Document the outcome

c. Communicate the outcome, let people know about best practices or about solutions to problems found

3. CHECK: Evaluate whether the outcome was effective

4. ACT/IMPROVE: Learn from and make changes based on the above.

Audits, day-to-day procedure implementation, and administration reviews will occasionally reveal deficiencies in a management system or activities that do not conform to the EMS or Sustainability Initiative as designed. Best practices may also be identified.

In the specific case of regulatory compliance audits or self-inspections, the measurement and monitoring activities will occasionally reveal (1) instances of noncompliance with regulations, or (2) situations that are contrary to objectives and targets. When these situations occur, corrective action must be taken to address and rectify the causes of the noncompliance or realign actions to meet specific objectives and targets. In these instances, it is important to document the follow-up steps taken as proof that the deficiency was addressed.

Preventive actions should be taken when breakdowns in administrative systems or measurement and monitoring of operational systems indicate critical processes are not "in control." Examples:

- If wastewater discharge monitoring shows a steady increase in pollutant concentrations that approach the discharge limit, preventive action should be taken to ensure that the wastewater treatment system is operating correctly so as not to exceed the limits.

- If internal hazardous waste self-audits indicate improper labeling or exceedance of storage limits, corrective action must be taken immediately to rectify the situations and preventative action must be taken to avoid reoccurrence.

In both examples above, the measurement/monitoring program and preventive action are directly linked. Similarly, measurements taken to evaluate progress toward various pollution prevention targets (for example, micro-scale chemistry or product substitution) may suggest preventive actions to ensure continued progress.

When nonconformance is identified, a corrective action should be taken to address and rectify the causes of the nonconformance as well as to continually improve.

Non-Conformance Corrective Action Form

The form on page IV-19 should be used to document corrective actions discovered during EMS audits, day-to-day implementation of procedures, and administration reviews. Specifically, the form enables you to document the event and its resolution by describing the “problem” (the EMS nonconformance), the most likely causes of the problem, possible solutions, implemented solution or outcome (corrective actions), and results.

Tips:

Use judgment in choosing when to employ the Corrective Action form to avoid unnecessary paperwork. Minor or isolated one-time occurrences that can simply be fixed on the spot need not necessarily generate paperwork.

Forms should be used for documentation and follow-up for serious or repeated nonconformance or for corrective actions which will require more than a quick fix. The same, or a similar form, can be used to log best practices.

Modify the form to best suit your needs.

Trap: Drowning in paper work

Focus on the purpose of the paperwork—identifying problems that need to be addressed and following up on them.

The following are brief examples of items that an auditor might list. Numbers 1-3 are examples of non-conformance and the fourth is recognition of best practices. (Remember: 'checking' back is an opportunity to affirm good practices, not just to find out what is lacking.)

Example 1: Operational controls do not reflect actual practices.

Example 2: Key participants are unaware of their responsibilities related to the EMS, Sustainability Initiative or project (as specified in the responsibility matrix).

Example 3: Labeling in laboratories still shows deficiencies.

Example 4: Purchasing department has implemented a process to ensure best quality, lowest cost green alternatives are purchased.

SAMPLE PROCEDURES

A Procedure for Nonconformance and Corrective Action on page IV-18 describes how and when corrective action will be taken. In this example, the procedure is implemented, in part, through the EMS Nonconformance Corrective Action form.

A Procedure for Nonconformance and Corrective Action for Compliance on page IV-20 is also included. The procedure is implemented, in part, through the Corrective and Preventive Action form. This form should be used to document corrective and preventive actions. Specifically, the form enables you to describe the "problem" (the

noncompliance event or situations inconsistent with meeting specific targets), the most likely causes of the problem, possible solutions, implemented solution (corrective actions), and results.

EXAMPLES OF PROCEDURES

Examples from other institutions can be found at:

http://www.ehs.wsu.edu/esrp490/nonconformance.htm

http://www.orcbs.msu.edu/environ/programs_guidelines/ems/procedures/EMS%20Corr.&%20Prev.%20Action.pdf

EMS NONCONFORMANCE CORRECTIVE ACTION FORM

Problem Identified: ____	Resolution Due Date: _____
Problem Identified By: _	Responsibility of:_____

PROBLEM (DESCRIBE EXISTING OR ANTICIPATED PROBLEM):

MOST LIKELY CAUSE(S):

POSSIBLE SOLUTIONS/FOLLOW UP ACTIONS

Possible Solutions Action Steps Date due: Completed: _____

1.

2.

3.

4.

5. etc.

RESOLUTION

Responsible Person:	
Signature and Date:	

EXAMPLES OF CORRECTIVE ACTION REPORTS

The following are examples of simple corrective action reports. Note that the level of detail and 'formality' of a corrective action report can vary depending on the complexity or severity of the issue.

Washington State University
Environmental Health & Safety
Service/Response Form

Name: John Reed
Contact Info: 509-335-9565
Area of work: EH&S, Environmental Services
Date: 4-19-06

What is the problem that results in nonconformance?:

SPCC plan needs revision + training for oil handlers needs to be developed.

What is the cause of the problem?:

SPCC regulations were amended + oil handler training is required to be complete by Fall 2007.

What is a solution or preventive action?:

SPCC plan was revised to reflect regulatory changes. SPCC oil handler training was developed + is now being delivered.

SAMPLE PROCEDURE

[College/University Name]	EMS Procedure	
	Effective Date	
	Subject	Nonconformance Corrective Action

Purpose This procedure is used to track nonconformance and identify best practices, root cause of nonconformance, and recognition or corrective action. Forms should be used for documentation and follow up for BMPs that should be modeled, for serious or repeated nonconformance, or for corrective actions which will require more than a quick fix.

Step 1 A corrective action that responds to EMS nonconformance is initiated using the attached EMS Nonconformance Corrective Action form. Corrective action may be initiated by a variety of events including internal audits, administration reviews, employee suggestions, and routine EMS procedures. The form describes the EMS nonconformance or deficiency, identifies the root cause(s) of the problem, describes the implemented solution, and summarizes the resolution of the corrective action. [If you want to include recognition of best practices, you may want to include a different form or a modification to one of the forms provided].

Step 2 The EMS Nonconformance Corrective Action form will be signed by the EMS Manager or designee and the responsible person.

Step 3 The responsible person must report the status of corrective actions to the EMS Manager at least every 2 weeks.

Step 4 Completed corrective action forms will be retained on site for at least 2 years after completion of the corrective action.

Responsible Person:	
Signature and Date:	

CORRECTIVE AND PREVENTATIVE ACTION FOR COMPLIANCE FORM

NONCOMPLIANCE OR POTENTIAL NONCOMPLIANCE

Problem Identified: ___	Resolution Due Date: _____
Problem Identified By: _	Responsibility of:

PROBLEM (DESCRIBE EXISTING OR ANTICIPATED PROBLEM):

MOST LIKELY CAUSE(S):

POSSIBLE SOLUTIONS/FOLLOW UP ACTIONS

Possible Solutions	Action Steps	Date due:	Completed:
1.			
2.			
3.			
4.			
Etc.			

RESOLUTION

Responsible Person:	
Signature and Date:	

SAMPLE PROCEDURE

[College/University Name]	EMS Procedure	
	Effective Date	
	Subject	Corrective and Preventive Action for Compliance

Purpose This procedure is used to respond to deficiencies and noncompliance with environmental regulations.

Step 1 Preventive action or corrective action that anticipates or responds to noncompliance is initiated using the attached Corrective and Preventive Action for Compliance form. Corrective or preventive action may be initiated by a variety of events including internal audits, administration reviews, employee suggestions, and routine EMS procedures. The form can be used to document the problem, identify the cause(s) of the problem, describe the implemented solution, and summarize the resolution of the corrective action.

Step 2 The Corrective and Preventive Action for Compliance form will be signed by the EMS Manager or designee and the person responsible for the actions taken.

Step 3 The responsible person must report the status of corrective actions to the EMS Manager at least every (Insert time frequency appropriate for your institution and circumstances).

Step 4 Completed Corrective and Preventive Action forms will be retained on site for at least 2 years after completion of the corrective or preventive action.

Responsible Person:	
Signature and Date:	

EXAMPLE OF CORRECTIVE AND PREVENTATIVE ACTION FOR COMPLIANCE FORM

NONCOMPLIANCE OR POTENTIAL NONCOMPLIANCE

Problem Identified: May 25, 2006 Estim. Resolution Due Date: May 30, 2006

Problem Identified By: R___ R___, Hazardous Waste Management Staff

PROBLEM (DESCRIBE EXISTING OR ANTICIPATED PROBLEM) THAT REQUIRES CORRECTIVE ACTION:

Four of 17 drums of hazardous waste stored in storage area B behind the Engineering Building were improperly labeled; one had no waste accumulation start date, two had no waste description, and one had no label.

MOST LIKELY CAUSE(S):

New employee in Engineering Building started at the beginning of May and didn't receive training during first week of work

Laboratory where new employee works didn't receive phone number for waste management department to receive support in handling and storing waste.

Supply of labels was low and existing labels were old and ineffective

POSSIBLE SOLUTION(S)/ACTION STEPS:

Re-label drums immediately (DONE).

Schedule and complete training for new employee and work with Human Resources to ensure proper training for waste management for new employees during orientation.

Meet with all laboratory managers in Engineering Building to review hazardous waste management procedures.

Provide new supply of labels and phone number magnets.

IMPLEMENTED SOLUTION(S):

Due Date: May 30, 2006

Completed: May 30, 2006

Re-labeled drums May 25th.

Trained new employee May 28 and met with HR May 30.

Conducted meeting with laboratory managers May 28.

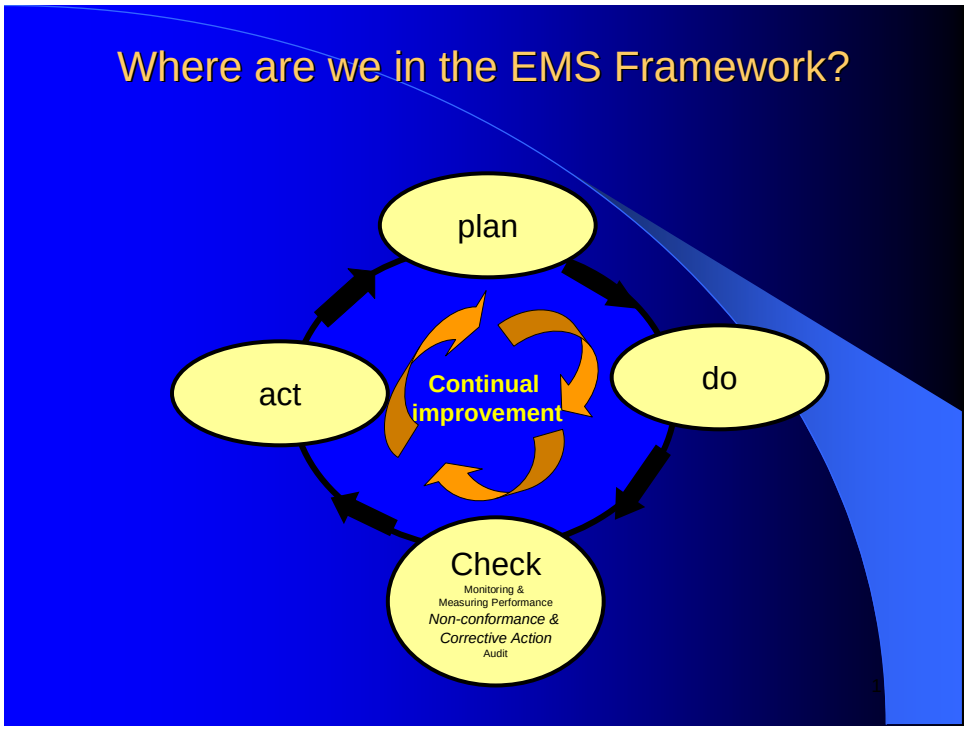
Resupplied labels and magnets May 30.

RESOLUTION (CONFIRM EFFECTIVENESS OF IMPLEMENTED SOLUTIONS):

Engineering Building staff has been trained/briefed on hazardous waste handling procedures and no further deficiencies have been noted for 3 months (dated September 1, 2006)

Responsible Person:	
Signature and Date:	

TIME TO PAUSE AND CHECK IN



The above figure shows where 'Nonconformance and Corrective Action' fits in the management system cycle. Audits (Are we doing what we said we would?) and Administration Review (How do we keep learning?) are next.

BEFORE GOING ONTO THE NEXT SECTION, ASK YOURSELF:

- ☐ ***Identifying problems:*** Have we developed a way to identify problems (nonconformance and noncompliance issues) and fix problems so they don't happen again?
- ☐ ***Recognizing good practices:*** Have we developed a way to recognize good practices and actions?
- ☐ ***Documentation:*** Do we have a written procedure that documents our way of identifying nonconformance, the need for corrective action, and the reporting of actions taken?

WHAT'S NEXT?

- Find ways to share the information about the problems you identify and resolve so they will not happen again.
- Likewise, use what you learn about best practices at your college or university that can be models for other departments or parts of the institution.
- Learn to identify needs and opportunities to improve adherence to procedures early.
- Continue on to find out if the system you have developed is working the way you wanted it to (through Corrective and Preventive Action for Compliance, Audits, and Administration Review) and celebrate your successes.

AUDITS: ARE WE DOING WHAT WE SAID WE WOULD?

Say what you do, Do what you say, Prove it.

PLAN-DO-**CHECK**- ACT:

There's only one way to know if your management system, initiative, or projects are really being implemented in a way to get results—you have to **CHECK**. You've seen initiatives come and go on your campuses—lots of great planning, hoopla, some changes, and then a tapering off or even sometimes a back-sliding into former practices and behavior, without any interest in or commitment to finding out if they were working or how they might be improved. Actively seeking out and resolving issues and deficiencies in how things are being implemented keeps the learning and improvements going. Periodic audits also establish whether or not all requirements of a management system or initiative are being carried out in the appropriate manner.

On the value of audits:

Auditing has improved our ability to communicate with UVM labs and led to the development of a much improved lab safety program. For example, in training, lab workers receive more useful information about specific lab safety issues that have arisen during audit visits. The audit program also has helped clarify for lab supervisors the institution's safety expectations and oversight process for laboratory activities, while identifying for upper administrators facility and other needs to improve safety.

Ralph Stuart, CIH
Environmental Safety Manager
University of Vermont

What is it? An audit[52] (internal, 2nd party or 3rd party) is like a snapshot in time, evaluating whether your institution is implementing what it said it would. It is a way of:

- Finding and fixing problems
- Finding and taking advantage of opportunities to improvements

An auditor looks for objective evidence that the EMS or initiative is working as designed and expected.

What purpose does it have? The purpose of your audit is to CHECK if the system is working as designed and what areas need improvement and to CHECK if you are doing what you said you were going to do. Audits should also identify corrective and preventive actions that should be taken to improve your ability to meet your goals. Auditing provides the Team and others with information they need to assess progress, provide direction, resources, or authority to make changes (see Administration Review on page IV-34).

Audit early, Audit Often!

What's in it? An auditor 'reviews' and evaluates the adequacy of documents, procedures, programs, and records and the implementation, integration and consistency of procedures and programs at a particular moment. Audits are used to look at your planned activities for meeting your goals, objectives and targets, how your systems control significant aspects, and environmental performance accomplishments. The auditor

[52] Audits can be done internally (but by people who are not those directly responsible for developing or maintaining the system being audited); by a second party such as a sister institution, local, state or federal agency, or by a third party such as outside consultants.

also looks for evidence of the administration's commitment to an environmental and/or sustainability policy and awareness and competency among employees. Finally, the auditor looks at how an institution is fulfilling its commitment to continual improvements. [53]

What does it make possible? Information gleaned from audits helps you:

- Maintain management's focus on the environmental performance, compliance, and sustainability
- Identify best practices
- Improve your initiatives and your management system
- Ensure that the system you are using is efficient and effective.

Tips

- Try to establish an agreement for auditing either between departments or with local universities.
- Make your internal audits into opportunities: use them to meet faculty, staff and students and to get to know their programs and concerns.

Traps to avoid

Not checking your policy commitments: Don't forget to look at whether your policy reflects what's happening on the ground.

Analysis by audit: The audit team should refrain from analyzing root causes or solutions while auditing. That step comes later.

Blurring the independence of auditors: Keep in mind that when members of an organization participate in audits, good audit practice requires that auditors should be independent of the area/process they are auditing. Auditors should swap departments for purposes of the audit and should not audit their own department or work.

Why do we need audits? For the same reason that we need tests, quizzes and reviews. You can't be sure you've improved without checking back. ***Note:*** If you are interested in ISO certification of your EMS, you must have a third-party audit conducted by an external, independent auditing organization that can provide registration or certification of conformity to the requirements of ISO 14001.

When should we develop it? As a rule of thumb, an EMS or Initiative should be audited at least annually. You can audit the entire EMS or Initiative at one time or break it down into discrete elements for more frequent audits. It is also recommended that you conduct internal audits on a more frequent basis so that (1) you uncover issues early rather than later, (2) audits (and auditors) become a recognized means of checking, and (3) audits are not perceived as scary and punitive. [Note that many experienced EMS technical assistance providers such as Global Environment and Technology Foundation (http://www.getf.org, http://www.peercenter.net) are incorporating 'mini' audits after each EMS element is developed. This approach gets everyone used to the idea of auditing early in the process and on a regular basis, reduces the

[53] *An Environmental Management System Troubleshooter' Guide for Local Governments.* Global Environment and Technology Foundation, p. 55.

anxiety about audits, and identifies opportunities to improve the management system early in its development, not way down the road.

Why do we need a procedure? As with everything else, if you don't develop and follow a procedure, chances are that audits will (a) never happen or (b) not continue because of faculty/staff/student turnover.

Peer-to peer audits

An example of the use of 2nd party audits is a voluntary peer review program developed by the Association of Independent Colleges and Universities of Pennsylvania to conduct multi-media environmental compliance audits. See http://www.waynesburg.edu/news/0506/environmental-program.htm .

STEPS TO DEVELOP AN AUDIT PROGRAM

1. Develop your audit procedure and protocols. Review some of the many examples that are available and adapt one to meet your needs. You can use the Gap Analysis in 'Phase I: 'Getting Started' to start you off.

2. Determine how frequently you need to audit. There are many options for how to manage your audit program. Partial audits can be done on a more frequent basis or you can audit your entire system. Depending on the size of our campus and your chosen footprint, pick a frequency that works for you.

Sources of Evidence

- Interviews
- Review of documents, records and data
- Observation of work and practices

Tips

- No matter what type of audit program you choose, knowledge of environmental regulations, facility operations, and environmental science is desirable. Some on the job training is also good to include in an auditing program. Your college and university's first few audits can be considered part of an auditor training program, but make sure that an experienced auditor or faculty takes part in those "training" audits so that you get trained auditors as a result.
- For EMSs, the auditors should be trained in auditing techniques and management system concepts. If you are seeking ISO certification, obtain a list of RABQSA EMS/ISO 14000 Registrars, see RABQSA International at http://www.rabqsa.com/search.html.
- During the audit, auditors should discuss identified deficiencies with the people who work in the area; this will help the auditors verify and validate their evaluations while raising awareness of the issues.
- If possible, train at least two people as internal auditors so they can work as a team comparing opinions, sharing strengths, and bringing expertise to the audit.
- Before you start an audit, be sure to arrange the schedule so that the right people will be available during the audit. If possible, work with the support people to keep everyone on the same page.
- For an EMS, think about dividing the auditing task into segments, so that you audit your entire system over a period of time. This makes the work seem less intensive than covering your entire system at once, and also provides an opportunity to have more continuity in interactions with faculty , students, and staff.

3. Determine who will perform the audit. You will need trained auditors, particularly if you are implementing a full EMS. These can be internal auditors (employees or student interns from your college or university), 2nd party auditors (e.g., employees of a sister institution), or 3rd party auditors (such as outside consultants or registrars).

4. Train your auditors: There should be both initial and ongoing training. (For EMSs, commercial EMS auditor training is available, but it might be more cost-effective to utilize students and faculty as part of a planned curriculum to obtain trained auditors.) If you are embarking on a sustainability initiative, working with faculty to develop your auditing program as you are designing your goals may be your best bet.

5. Determine how audit results should be used. Audits should be used to improve your programs and initiatives. The results should be evaluated, good practices highlighted, and deficient practices corrected. The key to environmental audits is that the focus is on improving performance. Audit results can be used to identify trends or patterns, and for EMSs, there should be a process to identify trends or patterns in deficiencies. Under an EMS audit, your college or university must also make sure that any identified system gaps or deficiencies are corrected in a timely fashion, and that the corrective actions are documented.

6. Consider linking your EMS audit program to your regulatory compliance audit process. Since EMS practices support compliance, it is relevant to look at both at the same time. (E.g., if you find an issue of people in a certain lab not being trained, you should ask to understand their system for identifying people that need to be trained). But keep in mind that these audit programs have different purposes, and while

you might want to communicate the results of EMS audits widely within your college or university, the results of compliance audits might need to be communicated in a more limited fashion.

What are the options to get EMS Auditors?

- **Consultants:** Hire EMS experts to develop and perform audits or train staff on auditing techniques.
- **Faculty and Students:** colleges and universities have access to professors, graduate, and undergraduate students who can serve as an excellent audit team. Whether trained and directed by outside consultants or professors, make sure your expectations of the audit team are met and consider paying your auditors. Training and including faculty and staff in auditing can have benefits to the audit process due to participants' knowledge of the organization, and can be an educational experience.
- **Other institutions:** Exchange services as an auditor with another college, university or area company; colleagues will likely best understand your organization and its operational challenges and can serve as a good comparative case study.

7. Set up your audit team, develop a work plan or audit plan and communicate with those being audited prior to the audit. You should also take the opportunity to let the administration know when you are preparing to perform a formal audit. The formal audit format should include an opening meeting, the body of the audit, and a closing meeting. An audit work plan can outline how these will be implemented and the timeframe. Whether formal or informal, before you start an audit, be sure to explain the audit scope, schedule, and other pertinent information to the people in the affected area to help avoid confusion and to foster trust. It keeps everyone on the same page and ultimately results in a better audit.

8. Perform the audit. Your audits should focus on objective evidence that demonstrates that you are following your intentions. For an EMS, the audit looks for evidence of 'conformance' (if you cannot tell whether or not a particular procedure has been followed, then you should consider revising the procedure as part of audit follow up actions). You can adapt gap analysis and EMS review materials to create an outline of what you want to look at during the audit (e.g., The Gap Analysis from Phase I (in Phase I, beginning on page I-18) or the C2E2 self-assessment from http://www.c2e2.org/ems_assessment/questionnaire/cover.htm both give an outline of relevant areas for auditing).

9. Report your results, keeping in mind the original decisions and what your procedure(s) require, and think about how to use the audit results.

10. Maintain audit records. Include audit reports and note(s) from follow up actions in your records.

Audit procedures should describe:

- Audit scope (extent and boundaries of an audit)
- Audit frequency
- Audit methods
- Key responsibilities
- Reporting mechanisms

And when implemented, should result in:

- Continuous improvement
- Consistent EMS performance
- Avoiding or minimizing surprises by anticipating problems

Audit plans should include methodology that will answer:

- Whether procedures are clearly written and responsibilities included.
- What documentation has been created, and is it sufficient to demonstrate conformance?
- What record(s) or observation(s) demonstrate(s) that the procedures have been followed?
- Are procedures effective (and how have they been effective or, if not, how is this demonstrated)?
- What improvements have been identified as needed and have they been implemented?

An unsatisfactory answer to these or other questions could indicate an “EMS Nonconformance.”

SAMPLE PROCEDURES

The procedure below describes in general the various steps of a self-audit at your institution. For an EMS audit, start with each of the elements in your system that you want to audit.

[College/University Name	EMS Procedure	4.5
	Effective Date	
	Subject	Self Audits

Purpose This procedure is used to define the process for scheduling, conducting, and reporting periodic, internal audits of the EMS. Internal audits help to ensure the proper implementation and maintenance of the EMS by verifying that activities conform to documented procedures and that corrective actions are undertaken and are effective.

Step 1 One or more auditors will be selected to form the audit team. If the team consists of more than one auditor, a Lead Auditor will be designated. The Lead Auditor will be responsible for audit team orientation, coordinating the audit process, and coordinating preparation of the audit report.

Step 2 The auditor(s) will be independent of the activities they audit, objective and free from bias to ensure the objectivity of the audit process and the findings.

The Lead Auditor will ensure that the team is adequately prepared to initiate the audit. Pertinent policies, procedures, standards, regulatory requirements and prior audit reports will be made available for review by the audit team. Each auditor will have appropriate audit training consisting of education, work experience, auditor training, and audit skills.

Step 3 The Lead Auditor is responsible for ensuring the preparation of a written plan for the audit. The Gap Analysis from Phase I (page I-18) or the C2E2 self-assessment (http://www.c2e2.org/ems_assessment/questionnaire/cover.htm)may be used as a guide for this plan.

Step 4 The departments and buildings as well as faculty, employees, staff and students to be audited will be notified a reasonable time prior to the audit.

Step 5 Conducting the Audit

1. A pre-audit conference will be held with appropriate personnel to review the scope, plan and schedule for the audit.
2. Auditors are at liberty to modify the audit scope and plan if conditions warrant.

3. Objective evidence will be examined to verify conformance to EMS requirements. Objective evidence can include information gathered through interviews, visual observation, or review of documentation such as operating procedures. All findings will be documented.

4. Specific attention will be given to corrective actions for audit findings from previous audits.

A post-audit conference will be held to present audit findings, clarify any misunderstandings, and summarize the audit results.

Step 6 The Lead Auditor will prepare the audit report, which summarizes the audit scope, identifies the audit team, describes sources of evidence used, and summarizes the audit results.

Findings requiring corrective action will be entered into the corrective action database.

Step 7 The [person in charge, such as the EMS project lead] is responsible for communicating the audit results to each area and those functionally responsible for managing the area.

Step 8 Staff in the affected departments and/or functional areas are responsible for any follow-up actions needed as a result of the audit.

Step 9 Audit reports will be retained for at least 2 years from the date of audit completion.

Responsible Person:	
Signature and Date:	

EXAMPLE OF A PROCEDURE

See an example at: http://www.ehs.wsu.edu/esrp490/emsaudit.htm

AUDIT FINDINGS FORM

INSTRUCTIONS:

An auditor can use this form to document nonconformance (EMS) or positive practices discovered during audits and as part of the evaluation after the audit to describe corrective or preventive actions required.

Type of Finding (circle one): **Date:** _____

Nonconformance:/Issue Major Minor Positive Practice

Description (specify location/department/activity and nature of problem)**:**

_____

_____

_____

Auditor: _____	Auditee's Rep.: _____

Corrective Action Plan (including time frames): **(Recommendation):**

_____

_____

_____

Preventive Action

_____

_____

_____

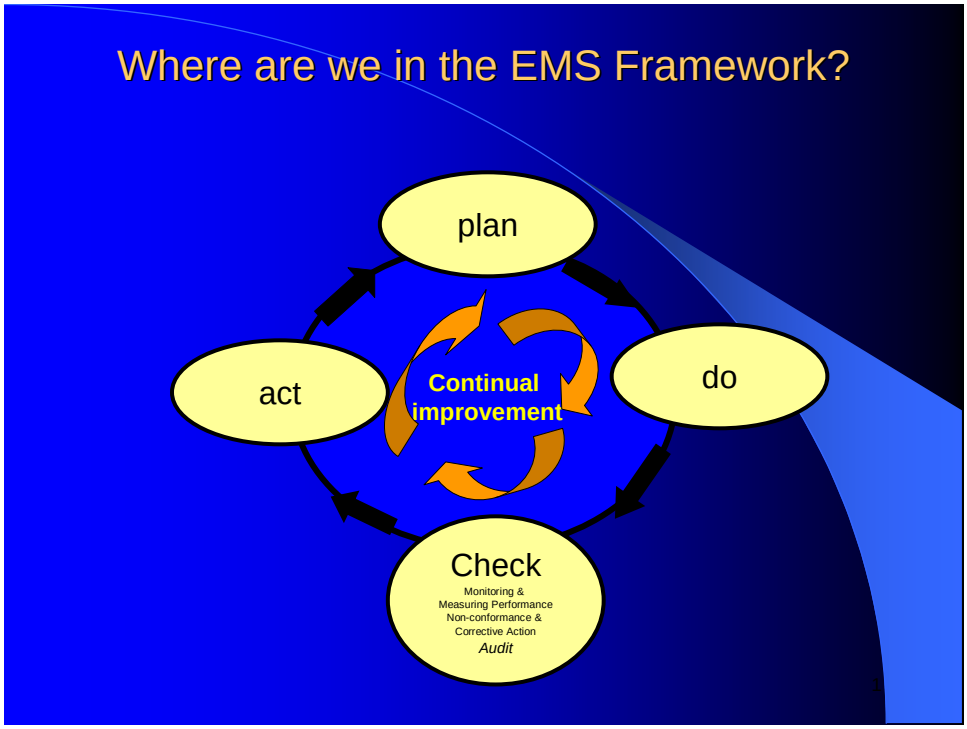
Individual Responsible for Completion of the Corrective Preventive Action: _____	Date Corrective Preventive Action Completed: _____

Corrective Preventive Action Verified By:

_____ Date: _____

Source: *Adapted from Environmental Management Systems: An Implementation Guide For Small And Medium-Sized Organizations, NSF International, 2001*

TIME TO PAUSE AND CHECK IN



The above figure shows where 'Audit' fits in the management system cycle. 'Administration Review' (How do we keep learning?) is discussed next.

BEFORE GOING ONTO THE NEXT SECTION, ASK YOURSELF:

- ☐ ***Audits:*** Have we developed a procedure and schedule for auditing? Have we trained internal auditors? Have we communicated the function of internal (and external) audits?
- ☐ ***Documentation:*** Do we have a written procedure that documents how, when and by whom audits will be conducted?

WHAT'S NEXT?

- Address issues identified in the Audit through Corrective Action and Preventive Action.
- Have a review of the audit findings by the Team
- Have an Administration Review
- Make adjustments, communicate, and keep improving.

ADMINISTRATION REVIEW: WHAT DO WE NEED TO DO TO IMPROVE? IS THE ADMINISTRATION AWARE, ENGAGED AND COMMITTED?

You've 'planned', you've 'done', you've even 'checked' through an audit. Now is the time to 'act' based on what actions you have taken and lessons you have learned.

What is it? An Administration Review is a periodic meeting held between the Administration and personnel involved in a project, EMS, or Sustainability Initiative to discuss the status of the system, the project or the initiative(s). Just as students on campus eventually have to report back to their 'administration' (e.g., parents) about their performance in order to receive affirmation, guidance and continued support (including financial), any Team working to improve environmental performance, compliance and sustainability will 'report' to their Administration.

What purpose does it have? The key questions that an administration review seeks to answer are: "Is our program working?" and "Is it suitable, adequate, and effective, given our vision, needs and goals?" For an ISO certified EMS, periodic management reviews are a requirement and must include evaluation of policy, compliance, communication with external parties, environmental performance, status of corrective and preventive actions, and follow-up from previous management reviews.

What's in it? It includes a review of information, discussion, assessment of whether the EMS or Sustainability Initiative is effective and an identification of what might need to change, as well as a presentation of the achievements over the previous time period since the last review. Outcomes can vary from a reallocation of resources, an adjustment to policies, specific follow up activities, a realignment of goals, and/or more visible support from the administration.

What does it make possible?
Administration reviews are the key to continual improvement and to ensuring that the work you are doing, whether it is a project, a sustainability initiative, and/or a management system will continue to meet your college or university's needs over time. In fact, administration review should be viewed as much as an opportunity to promote the value of your efforts as well as to receive constructive feedback and needed support.

Administration reviews are also a good opportunity to keep your management system efficient and cost effective. For example, some organizations have found that certain procedures and processes initially put in place were not needed to achieve their environmental objectives or control key processes. If EMS procedures and other activities don't add value by contributing to

Tips

- Remember your audience: they may not be as interested as you are in all the details about what's been done—they want to know what has been accomplished, what the outcomes of your work are.
- Think about whether you are providing too much information (or not enough).
- Connect the results of the work to the priorities of the institution and be sure to include the opportunity for the administration to reaffirm the policy that started your project, EMS or Initiative.
- If possible, have the meeting proceed as a discussion, so that the administration feels a part of the project (or EMS or initiative) and to ensure you get needed feedback.
- Don't be afraid to ask for something—these kinds of reviews are often the time to do it
- Use this time as an opportunity to recognize the hard work of the Team (and others).

continuous improvement, use the administration review as an opportunity to key them up to be eliminated.

Why do we need it? Your institution made investments in an EMS, Sustainability Initiative, or individual projects to improve compliance or environmental performance. The Administration should hear how it's going, and you need them to continue to affirm their vision, offer their advice, concerns, direction and support.

When should we do it? You schedule administration reviews at appropriate intervals, depending on the degree of involvement of the upper levels of your administration. Reviews should be conducted on an annual basis at a minimum and usually following audits so you have fresh data on actual performance versus what you planned.

Why do we need a procedure? A procedure helps you stay on track and actually make this review happen. It helps you to develop a format and process that becomes familiar over time.

Traps to avoid

- **Thinking "We're not ready; let's wait awhile"**: Don't keep putting it off; you will never be totally ready. Remember, this is all about continual improvement.
- **Having no communication to senior management until it's time for a review:** As previous sections have emphasized, you should be communicating all along the way, not just at the end.

STEPS TO DEVELOP ADMINISTRATIVE REVIEWS

1. Determine the frequency for administration reviews that will work best for your institution. Some colleges and universities combine these reviews with other meetings (such as administration meetings), while others hold "stand-alone" reviews

2. Determine who should be at the review. Think back to when you started on this process. You identified the high level support that you would need, and you identified what their role would be. The administrative review is a key place where these are put into play. Generally, three kinds of people should be involved in the administration review process:

   i. People who have the right information and knowledge (i.e., EMS Manager, Team members, Sustainability Director)

   ii. People who will be directly impacted by findings or recommendations

   iii. People who can make decisions (i.e., Chancellor, Provost)

3. Identify the topics you will cover in your Administrative Review:

- Is our environmental policy still relevant and current?
- Did we achieve our objectives and targets? (If not, why not?) Should we modify our objectives? Should we set new objectives and targets?
- Is a new aspects or impacts analysis needed?
- Are roles and responsibilities clear and do they make sense?
- Are we applying resources appropriately?
- Are our procedures clear and adequate? Do we need others? Should we eliminate some?
- How well are we measuring and monitoring what we are doing and/or our management system (e.g., via system audits)?
- What effects have changes in procedures, facilities, and materials had on our EMS or Sustainability Initiative and their effectiveness?
- Do changes in laws or regulations require us to change some of our approaches?
- What stakeholder concerns have been raised since our last review?
- Is there a better way?
- What else can we do to improve?

(If the EMS or Sustainability Initiative is only focused on certain departments, you should ask whether you want to expand to other departments or campus-wide).

4. Have the review assess how changing circumstances might influence the suitability, effectiveness, or adequacy of your EMS or Sustainability Initiative. Changing circumstances may be internal to your organization (for example, new facilities or new materials, changes in administration or budgets), or may be external factors (such as new laws, new scientific information, new enforcement initiative, changes in adjacent land use, or restructuring of a public university system).

5. Make sure that someone takes notes on what issues were discussed, what decisions were arrived at, and what action items were selected. Administration reviews should be documented. If necessary, be prepared to give a summary of what you heard from the administration during the review, particularly if you are including the review during another, previously scheduled, meeting. Sum up the points of agreement, where changes will be expected and what resources were allocated during the meeting. This is one way to confirm agreement on decisions regarding changes for continual improvement.

6. Once you have documented the action items arising from your administration review, be sure to follow up. Progress on these action items should be tracked.

As you evaluate potential changes to your EMS and/or Sustainability Initiative, consider other organizational plans and goals. Environmental and sustainability decision-making should be integrated into your overall management strategy.

SAMPLE PROCEDURE

[College/University Name]	EMS Procedure	4.6
	Effective Date	
	Subject	Administration Review

Purpose The purpose of this procedure is to document the process and primary agenda of issues to be included in the Administration Review meetings for evaluating the organization's EMS. The Administration Review process is intended to provide a forum for discussion and improvement of the EMS and to provide management with a vehicle for making any changes to the EMS necessary to achieve the organization's goals.

Step 1 The EMS Manager is responsible for scheduling and conducting a minimum of [pick your #of meetings] Administration Review meetings during each 12-month period. The EMS Manager is also responsible for ensuring that the necessary data and other information are collected prior to the meeting.

Step 2 At a minimum, each Administration Review meeting will consider the following:

- the suitability, adequacy and effectiveness of the environmental policy
- the suitability, adequacy and effectiveness of the environmental objectives (as well as the organization's current status against these objectives)
- the overall suitability, adequacy and effectiveness of the EMS
- the status of corrective and preventive actions and the results of any EMS audit conducted since the last Administration Review meeting
- the suitability, adequacy and effectiveness of training efforts
- communications with outside stakeholders
- the results of any action items from the previous Administration Review meeting

Step 3 Minutes will be taken of the Administration Review. These meeting minutes will include, at a minimum, a list of attendees, a summary of key issues discussed, and any action items arising from the meeting.

Step 4 A copy of the meeting minutes will be distributed to attendees and any individuals assigned action items. A copy of the meeting minutes will be retained on file.

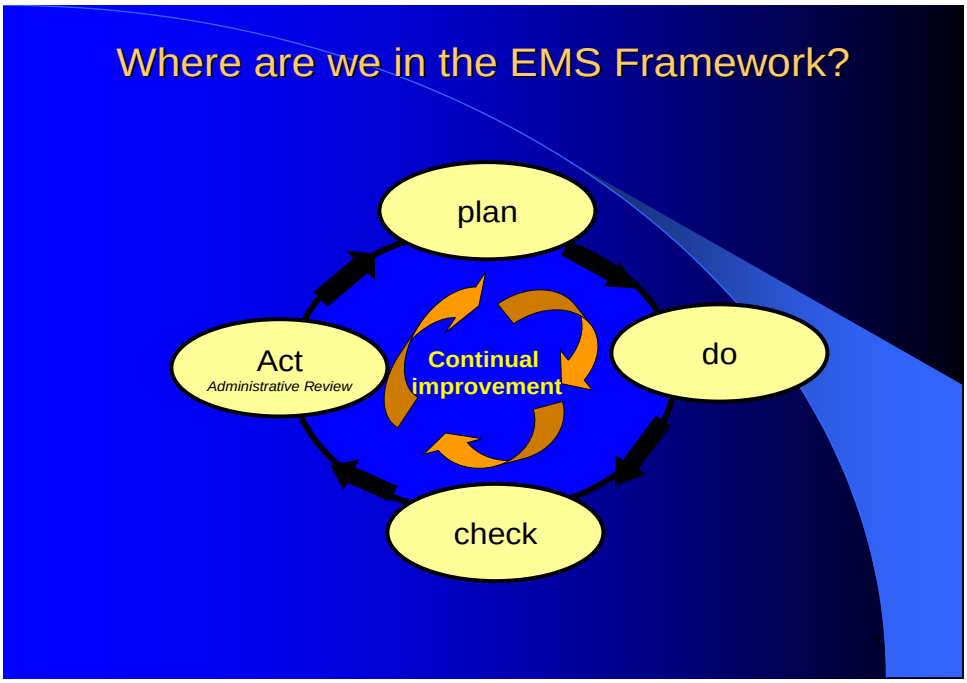
Responsible Person:	
Signature and Date:	

EXAMPLES OF PROCEDURES

Examples can be found at:

- http://www.ehs.wsu.edu/esrp490/managementreview.htm
- http://www.orcbs.msu.edu/environ/programs_guidelines/ems/procedures/Administrative%20Management%20Review.pdf

TIME TO PAUSE AND CHECK IN



The above figure shows where 'Administration Review' fits in the management system cycle.

WHAT'S NEXT?

Getting through a complete Plan-Do-Check-Act cycle is not easy. If you have gone through the cycle, you should pause and congratulate yourselves.

Look back and have the Team consider:

- *Was it worth it?*
- *What did we find out or do that we would never have known or done otherwise?*

- *What would we do over again? What would we change?*
- *What do our efforts to date mean for continuing to improve compliance, environmental performance and sustainability?*
- *How are we going to communicate our successes, efforts, and continuing challenges?*
- *Do we expand our efforts or hunker down?*
- *Do we need new perspectives on the Team?*
- *How do we keep the momentum going?*

Use your answers with the ideas in Phase V to keep you going.

PHASE V: HOW DO WE KEEP UP THE MOMENTUM?

The excitement of kicking off new projects, pulling together new teams to develop your system, or embarking on a new initiative is contagious. Completing the first round of measurement and success, and reporting your results to your administration gives a true sense of accomplishment, particularly the first cycle you go through. The question then becomes how to build on your accomplishments and keep the excitement in your program. Many practitioners have discovered that if you don't keep your eye on momentum, people will lose their focus. In addition, keep in mind that team members do move on, and new priorities come up.

How do you keep up the excitement and motivation to continue and expand an effort to improve compliance, environmental performance and sustainability?

Much of this guide has focused on EMS implementation tools as a means to an end. Remember that neither the tools nor the system itself are the end, but the beginning. The concepts that have been outlined in this guide are part of a cycle so that once you have successfully implemented your EMS, set up a Sustainability Initiative, or completed a project, the tools you have learned to use and the system you have created will continue to help you achieve environmental improvements. It cannot be stressed enough that the review process that you have set up should serve to continuously improve your system, and this means that it won't be a static system. It is meant to grow and change.

It may have seemed hard to get the new systems in place, but you should use what you have learned in order to maintain them and expand them into additional 'fencelines', campuses, and operations. After you have gone through all the phases and are performing under your management system, continue to think about how to further incorporate elements of the system as much as possible into the day-to-day operations of your campus.

Successful factors in keeping up momentum include:

- Recognition of efforts by teams and individuals.
- Audits, audits and more audits, particularly if they are in the context of learning how to improve rather than finger-pointing and punitive exercises.
- Communication of accomplishments, particularly in terms that are meaningful to the audience (e.g., different audiences on campus will be more interested in avoided or reduced costs, increased educational opportunities, avoided penalties, improved reputation and recognition, reduced energy use, etc.)
- Using the information (environmental, compliance, costs) from the process to inform decisions and the allocation of resources.
- Defining meaningful and specific goals to reach for.
- Bringing people into the process from across a campus rather than keeping your efforts in one office.
- Reinforcement and affirmation of efforts as an integral part of the mission and vision of the institution.

Common traps that sap motivation and slow momentum include the following:

- The 'Plan-Do' elements of a management system are developed but audits and administrative review never seem to happen.
- The 'champion' is so closely identified as owning the effort that if he or she leaves, there is no one to pick it up and move forward.
- Recommendations are made for changes but go nowhere, with little or no explanation or feedback on why.
- The manual handling and tracking of all the SOPs, systems procedures, and reference materials is overwhelming.
- Results and accomplishments are not measured and/or communicated.
- The work of teams and individuals is not recognized.

Tips for Survival

- Celebrate your successes!
- Remember the cycle – the completion of one cycle in Planning-Doing-Checking-Acting is the beginning of the next cycle. You need to think ahead, so start the next planning round as you develop your administration review – be prepared to tell your champions what you need.
- Determine what your goals will be into the future; use them to drive continual improvement.
- Network, be creative, and always be on the lookout for different ways to focus on the institution's goals.
- Design your procedures to be as simple and straight forward as possible.
- Take the time to develop a solid internal audit program; don't spare training if needed.
- Use audits in positive and constructive ways to bring attention to issues, affirm good behavior, and address resources needs.
- Work to influence suppliers and contractors.
- Keep the process open to others, not just the original team, safety, health and environmental professionals or Sustainability Office.
- Seek qualified expert services when needed.
- Network with others who have gone through or are going through similar experiences.
- Remember what's at stake.

SUGGESTIONS

1. Compile and widely disseminate information on tangible results or outcomes of your efforts to improve compliance, environmental performance and sustainability. Collect and use information that resonates with decision-makers across your institution (e.g., reduced or avoided costs, reduced emissions, decrease in the use of toxic materials, reduced or avoided use of natural resources).
2. Work with faculty to design some of the review milestones into course curricula so that they are done as part of the academic year.
3. Incorporate compliance activities into daily, weekly or monthly schedules for employees and/or laboratory personnel and have a scorecard (for example http://www.c2e2.org/2002xlprogress/regrading.htm) so that there's some competition to getting good grades on compliance, and there is a continuing focus on housekeeping.
4. Find ways to use classes to develop the measures for your campus's impact on the environmental goals you have set.
5. Consider holding an annual event or events that will showcase all the environmental/sustainability activities on your campus. This will not only help you celebrate success, but is a way to reach out and network with students, faculty and staff to develop new connections and bring new people onto your teams. Be open and invite other campus and local environmental or sustainability interests if they are not already working with you. Some examples include

   http://www.greencampus.harvard.edu/conference/index.php

   http://www.yale.edu/sustainability/consortium.htm

   http://www.climatecampaign.org/ .
6. If an annual gala affair is too much, consider an internal renewal. The University of North Carolina performs a strategic plan renewal exercise (see 2005 EHS Strategic Plan Renewal from http://ehs.unc.edu/management.shtml) for example.
7. Set up green teams, for example http://www.greencampus.harvard.edu/greenteams/ that can become self-supporting teams that will help keep your system moving ahead.
8. Participate in formal membership programs that provide challenges such as Recyclemania http://www.recyclemaniacs.org/index.htm .
9. Participate in other programs that include structured reminders and opportunities to showcase beyond your campus, such as:
   a. Waste Wise program, http://www.epa.gov/wastewise/
   b. Energy Star program, http://www.energystar.gov/index.cfm?c=higher_ed.bus_highereducation http://www.energystar.gov/ia/partners/promotions/change_light/downloads/Handout_Higher_Ed_0606.pdf
   c. Performance Track program http://www.epa.gov/performancetrack/
   d. Laboratories for the 21st Century program at http://www.labs21century.gov/ .

10. In addition, challenge students to put their energy into your campus initiative through the People, Prosperity and the Planet Student Design Competition for Sustainability which provides opportunities for students to get involved, http://es.epa.gov/ncer/p3/

What are your experiences in keeping the momentum going at your college or university? Please share your thoughts and tips by emailing:

Snyder.Gina@epa.gov

Madeline_Snow@uml.edu