



Integrated Environmental Management Systems: A Design for the Environment Approach

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DfE's IEMS Goals

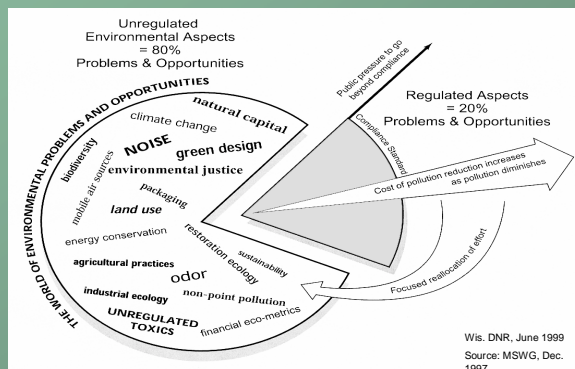
- To ensure that EMSs drive continuous environmental improvement
 - Emphasize P2 and DfE principles and tools
- To make EMSs easier
 - Provide technical support in
 - Identifying & prioritizing significant environmental aspects (SEAs)
 - Evaluating alternatives for environmental improvement
 - Lead Partner organizations provide common materials, mentoring, and recognition

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P2 is Key to Effective EMSs



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Chemical Focus is Critical

- 10,000 + chemicals in commerce at any time
 - Fewer than 700 chemicals are regulated
- 2,800 high-production-volume chemicals
 - Complete hazard data available on 7%
- Implications
 - Overwhelming need for more chemical information
 - Sheds doubt on the presumption of safety
 - Regulations are necessary, but limited to clear risks
 - Organizations must become responsible for smart chemical substitution

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EMSs Drive Efficiency



<u>Benefit Category</u>	<u>% of Facilities</u>
➤ <i>Increased management efficiency</i>	➤ 94%
➤ <i>Increased operational efficiency</i>	➤ 78%
➤ <i>Reduced liability</i>	➤ 53%
➤ <i>Regulatory benefits</i>	➤ 53%
➤ <i>Improved customer/supplier relationships</i>	➤ 19%
➤ <i>Community relations improvement</i>	➤ 13%

Source: NCDEMS

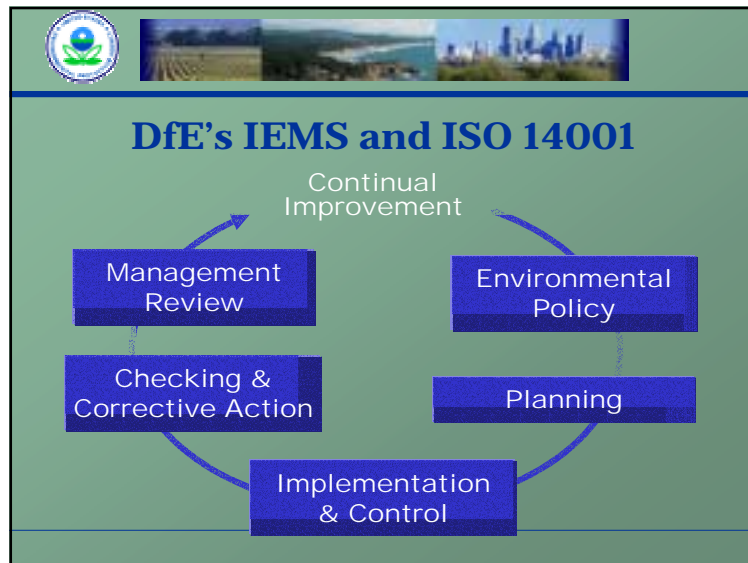
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DfE's IEMS Guidance

- Implementation Guide 
- Company Manual Template 
- Website
 - www.epa.gov/dfe

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IEMS Enhancements: Commitment and Policy

- **Commitment to compliance**
- **Promotes environmental leadership**
 - Management of hazardous chemicals -- both regulated and unregulated
 - Cross-media impacts
 - Integrated EH&S
 - Energy and resource efficiencies (includes global warming)
 - Extended product and supply chain responsibility

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IEMS Enhancements: Planning

- DfE gaps analysis
- Detailed process mapping of materials, chemicals, and resource flows
- Identifying company impacts on environment
 - Identify and profile chemicals
- Use risk concerns to help select SEAs and set objectives
- Conduct root cause analysis for each SEA

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Determining Significance of Environmental Aspects



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What is Risk?

Human and environmental risk is an expression of the likelihood of or potential for adverse health or environmental effects from a specific type and level of exposure.

Risk = toxicity + exposure

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Determining Significance of Environmental Aspects

- Toxicity
- Exposure
- Regulatory concern
- Worker safety and health
- Community issues
- Natural resource impacts
- Practical considerations
- Recent addition: Security concern

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Organizing Hazard Information

Worksheet 3-1: Health, Safety and Environmental Potential Effects Information

Operation	Chemical Name(s) / Agent	CAS# / Trade Name(s) / Other Identifiers	Regulatory Data: Carcinogen? IDH# Potentially Exposure Limit (PEL) Variable Organ: Compound (AOE)? Toxic Release Inventory (TRI)?	Human Health Effects by Pathways Acute and Chronic			Effects on Wildlife and Other Environmental Effects			Worker Safety	Risk	
				Inhalation	Dermal	Oral	Air	Water	Land		Human	Wildlife
Process Step 1			see paragraph 18 page 10 page 10, see VOS on TR	Severe: Irritant; Moderate: Irritant	Severe: Irritant; Moderate: Irritant	Severe: Irritant; Moderate: Irritant	Severe: Irritant; Moderate: Irritant	Severe: Irritant; Moderate: Irritant	Severe: Irritant; Moderate: Irritant	Severe: Irritant; Moderate: Irritant	Severe: Irritant; Moderate: Irritant	
Contact Person:				Date Completed:								

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Organizing Exposure Information

Worksheet 3-2: Exposure to Chemicals and Materials

Operation	Aspect	Quantity Used per time period	Exposure Time		Personal Protective Equipment (PPE)	Pathway			Most Exposed Groups		
			Duration	Frequency		Human: Inhalation, Dermal, Oral	Environment: air, water, land	Workers	Community	Business: staff	
process step 1	emissions, spills, disposal, storage, etc.	10 lbs per day	15 min	1 time per day	appropriate gloves	inhalation	air, water, land	High risk PPE	Workers	Community	Business: staff
Contact Person:					Date Completed:						

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IEMS Enhancements: Implementation

- For each SEA, develop an environmental management program that
 - Includes a cleaner alternatives assessment
 - Identify alternative chemicals, products, and processes
 - Compare them on environment, performance, and cost
 - Incorporates other relevant pollution prevention and best practice information
- Continuous *environmental* improvement

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Making EMSs Easier

- Identify a lead organization
- Build in economies of scale and share information wherever possible
- For example:
 - Customize the IEMS Implementation Guide for your sector...or for key activities common to multiple sectors

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Making EMSs Easier

- Develop a detailed process map showing typical processes
- Identify environmental aspects typical to sector/activity
- Develop database of chemical information
- Hold workshops
- Mentor
- Provide regulatory baseline, health and safety, and chemical process information

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Making EMSs Easier

- Conduct cleaner alternatives assessment for common SEAs
- Compile pollution prevention checklists, best practice information
- Identify environmentally preferable products
- Encourage participation in voluntary programs (such as Energy Star) that have technical assistance on common environmental aspects

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“...It has been encouraging to see how much a ‘cooperative spirit’ can accomplish.”

Leif Anderson, Vice-President,
Anderson Chemical Company

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