

# HS-22 Environmental Management System (EMS) Briefing

The logo consists of the lowercase letters 'ems' in a bold, sans-serif font. The letters are rendered in a 3D, metallic style with a blue and silver color scheme, giving them a reflective, industrial appearance.

***June 11, 2009  
Room GH-027  
DOE Forrestal Building  
Washington, D.C.***

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The Shaw logo features a stylized orange triangle above the word 'Shaw' in a bold, sans-serif font. To the right of 'Shaw' is the tagline 'a world of Solutions' in a smaller font, with a trademark symbol.



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# Welcome and Introductions

- Today's Instructor
  - Lisa Burns (Shaw Environmental - Cincinnati)



# Outline of Today's Schedule

- **Welcome/Introductions**
- What is an EMS?
- EMS Regulatory Drivers
- Benefits of EMS
- Elements of an ISO 14001-structured EMS
- DOE-specific Declaration/Validation process
- Integration with ISMS and other programs
- Implementation Issues within DOE
- EMS Performance Tracking – Strengths and Weaknesses
- ARRA Initiatives
- Integrating Sustainability into Clean up, Stabilization and Decommissioning Activities

# Why an EMS?



How the customer explained it



How the Project Leader understood it



How the Analyst designed it



How the Programmer wrote it



How the Business Consultant described it



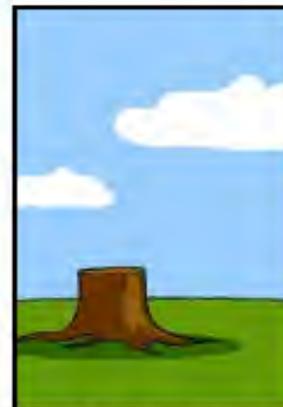
How the project was documented



What operations installed



How the customer was billed



How it was supported



What the customer really needed

# What is meant by Sustainable?

“Humanity has the ability to make development sustainable – to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs”

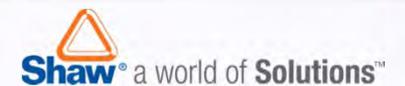
*World Commission on Environment and Development*

Each choice we make has a “cost”. True cost is the combination of the economic, social, and environmental costs set against the offsetting benefits associated with each choice we make.



# Environmental Management Systems (EMS) Basics

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# What is an EMS?

- Management approach to determine, prioritize, implement, and improve on environmental issues that will lead to sustainable environmental stewardship

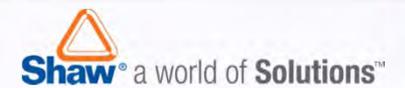


# Keep in mind...

- The EMS and related measurement tools are just that- **TOOLS**. Alone, they will not guarantee success.
- The organization must **use** the tools, not just **have** them.
- A useful EMS is “alive”; constantly measuring performance, making adjustments, and looking for continual improvement opportunities.

# EMS Regulatory Drivers

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# Environmental Regulatory Drivers

## Federal Drivers

Pollution Prevention Act of 1990  
Resource Conservation & Recovery Act (RCRA)  
Comprehensive Environmental Response, Compensation, Liability Act (CERCLA) 1980  
Clean Air Act/Clean Water Act  
Emergency Planning and Community Right-to-Know Act  
Energy Policy Act of 1992 and EPA Act 2005

## Executive Order

E.O. 13423 – Strengthening Federal Environmental, Energy and Transportation Management

## DOE Orders

DOE Order 450.1A – Environmental Protection Program  
DOE Order 430.2B – Departmental Energy, Renewable Energy, and Transportation Management

# E.O. 13423 “*Strengthening Federal Environmental, Energy, and Transportation Management*”

- Signed January 24, 2007; Revoked five previous “Greening the Government” Executive Orders; integrated and updated prior practices and requirements and reinforces the Federal governments commitment to environmental and energy efficient management of federal facilities
- Establishes goals for implementing Sustainable Practices
- Requirements:
  - Improve energy efficiency and reduce greenhouse gas emissions – realize 30% reduction in energy intensity (Btu/gsf) by end of 2015 relative to FY 2003 baseline (or 3% per year)
  - Requires use of renewable energy – ensure that half of DOE’s renewable energy consumption per year comes from new renewable energy sources and that DOE implements renewable generation projects on DOE property
  - Reduce water consumption – realize 2% annual water consumption reduction annually starting in FY 2008 and 16% by FY 2015
  - Sustainable Procurement - purchase environmentally preferable products including recycled content and bio based products, energy efficient electronics, water efficient products, and purchase **only** 30% post-consumer fiber content paper

# Requirements continued:

- Ensure use of Electronic Product Environmental Assessment Tool (EPEAT) when purchasing electronic products
- Enable Energy Star<sup>®</sup> feature on computers and monitors and implement electronic stewardship practices for electronic use and disposition
- Reduce quantity of toxic and hazardous materials purchased, used, and disposed – increase diversion of solid waste and maintain waste prevention and recycling programs
- Reduce petroleum consumption and purchase alternatively fueled vehicles- reduce vehicle fleet consumption of petroleum by 2% annually thru 2015; increase total fleet consumption that is non-petroleum based by 10% annually; and use plug-in hybrid (PIH) vehicles when commercially available at reasonable cost

# Requirements continued:

- Ensure new construction and major renovations comply with Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding– incorporate the “Five Guiding Principles” for sustainable development:
  - Integrate design principles
  - Optimize energy performance
  - Protect and conserve water
  - Enhance indoor air quality
  - Reduce environmental impacts of materials

# DOE Order 450.1A Requirements

- Originally issued 1/15/03; re-approved 6/4/08
- Designed to implement sound stewardship practices that are protective of the air, water, land, and other natural and cultural resources impacted by DOE operations in a cost effective manner
- Includes requirements for the following programs:
  - Pollution prevention
  - Groundwater protection
  - Cultural resource protection
  - Environmentally Preferable Purchasing
  - Life-cycle assessment
  - HazMat programs
  - Surplus/Excess property programs
  - Surface water protection
  - Natural resource protection
  - Air quality protection
  - Environmental monitoring
  - Energy efficiency
  - ODS programs
  - PPOA's

# New Requirements of 450.1A

- Incorporate E.O. 13423 requirements; must be reflected in the EMS
- Reflect **framework** found in ISO 14001:2004
- Serve as primary management approach for addressing site environmental aspects
- Include specific compliance management elements (audit program)
- Coordinate DOE O 430.2B requirements into EMS
- Ensure full integration with ISMS (DOE O 450.4)
- Conduct formal audit by a qualified party outside the control or scope of the EMS before declaring initial implementation and every three years there-after

# Dates and Deadlines for Declaration

- **DOE managers are to declare DOE EMS's in conformance with new requirements by June 30, 2009 – 20 days away!**

If you don't talk to  
your cat about catnip,  
who will?



# Program Secretarial Office (PSO) Requirements for DOE O 450.1A

- Annually assess effectiveness of the integration of EMS into ISM, compliance with environmental requirements, and achievement of the DOE Sustainable Environmental Stewardship Goals
- Ensure site-specific, measurable environmental objectives and targets are set and contribute toward achievement of DOE Order goals
- Request appropriate funding to implement the DOE Order
- Select annual “Best-in-Class” environmental sustainability nominees
- Ensure DOE O requirements flow down to contractors in CRD
- Develop and promote performance standards for relevant DOE personnel
- Ensure DOE personnel receive EMS training

# DOE Order 450.1A – Attachment 2

- Includes five performance-based Sustainable Environmental Stewardship Goals:
  - Reduce or eliminate the generation and/or toxicity of waste at the source through pollution prevention
  - Reduce or eliminate the purchase, use, and release of toxic and hazardous chemicals and materials
  - Maximize purchase and use of environmentally preferable products
  - Reduce or eliminate environmental impacts of electronic assets
  - Recycle post-consumer material



# DOE Order 430.2B Requirements

- Identifies aggressive energy and water reduction goals from FY 2006 through FY 2015.
- Directs DOE-owned and contractor-operated sites to develop Energy Management Plans that outline how goals will be accomplished
- All new buildings and major renovations with a value exceeding \$5M must attain US Green Building Council (GBC) Leadership in Energy and Environmental Design (LEED) Gold Certification

# Energy Management



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# MOX BAD Building



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# Benefits of an EMS

- Improves environmental performance based on a defined, internationally accepted system
- Provides standardization among sites
- Documented/defined practices
- Heightens worker awareness of environmental issues
- A “preventative” attitude is installed
- IMPACT driven NOT requirement driven
- Provides a decision-making tool for prioritizing tasks
- Reduce risks and liabilities (hazards)
- Reduces reporting and permitting
- Reduces resource usage/increases conservation efforts
- Minimize wastes, energy, and water usage
- Reduce overall process and project costs
- Increase efficiencies – SMART business!
- Effectively monitors performance

# What DOE Organizations said EMS Implementation has done for them

- Enhanced EMS integration and awareness by site personnel
- Improved management involvement in environmental issues
- Better use of pollution prevention and sustainable practices during day-to-day activities
- Improved environmental performance
- Better relations with outside entities
- Improved environmental compliance
- More environmental awards!!

# ISO 14001:2004

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# What is ISO 14001:2004?

- Series of international, voluntary environmental management standards.
- Provides a common framework for managing environmental issues
- ISO 14000 does not establish absolute requirements for environmental performance
- ISO 14001 is a **FRAMEWORK or TOOL**
- Adoption does not guarantee optimum environmental outcomes
- ISO 14001 DOES require management commitment and encourages performance
- ISO writes standards; does not enforce!

# Origins of ISO 14001

- ISO/Strategic Advisory Group on the Environment (SAGE) – 1990
- Global EMS Standard – 1992
  - Wanted a framework for the EMS
  - Promote improved environmental protection
- ISO 14001 Standard Finalized – Fall 1996
- ISO 14001 Standard Revised - 2004

# ISO 14001 EMS Overview

**Policy**  
4.2

**Planning**  
4.3

- 4.3.1 Environmental Aspects
- 4.3.2 Legal and Other Requirements
- 4.3.3 Objectives, Targets and Programs

**Implementation & Operations**  
4.4

- 4.4.1 Structure and Responsibility
- 4.4.2 Training, Awareness, and Competence
- 4.4.3 Communication
- 4.4.4 EMS Documentation
- 4.4.5 Document Control
- 4.4.6 Operational Control
- 4.4.7 Emergency Preparedness and Response

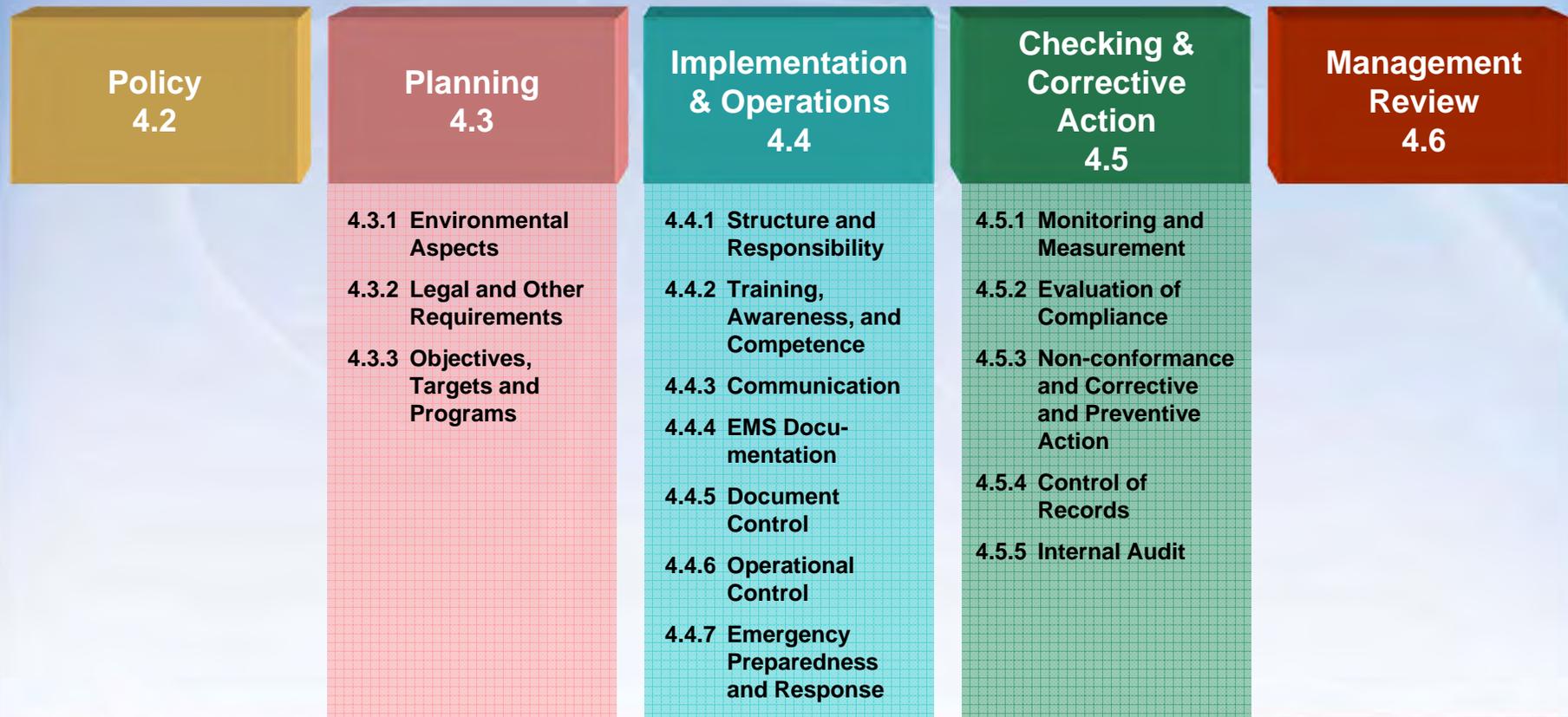
**Checking & Corrective Action**  
4.5

- 4.5.1 Monitoring and Measurement
- 4.5.2 Evaluation of Compliance
- 4.5.3 Non-conformance and Corrective and Preventive Action
- 4.5.4 Control of Records
- 4.5.5 Internal Audit

**Management Review**  
4.6

# 4.1 General Requirements

- ISO requires the organization establish, document, implement, maintain and continually improve an EMS in accordance with the 17 discrete elements ISO 14001 standard and document the scope of its EMS



# 4.2 EMS Policy

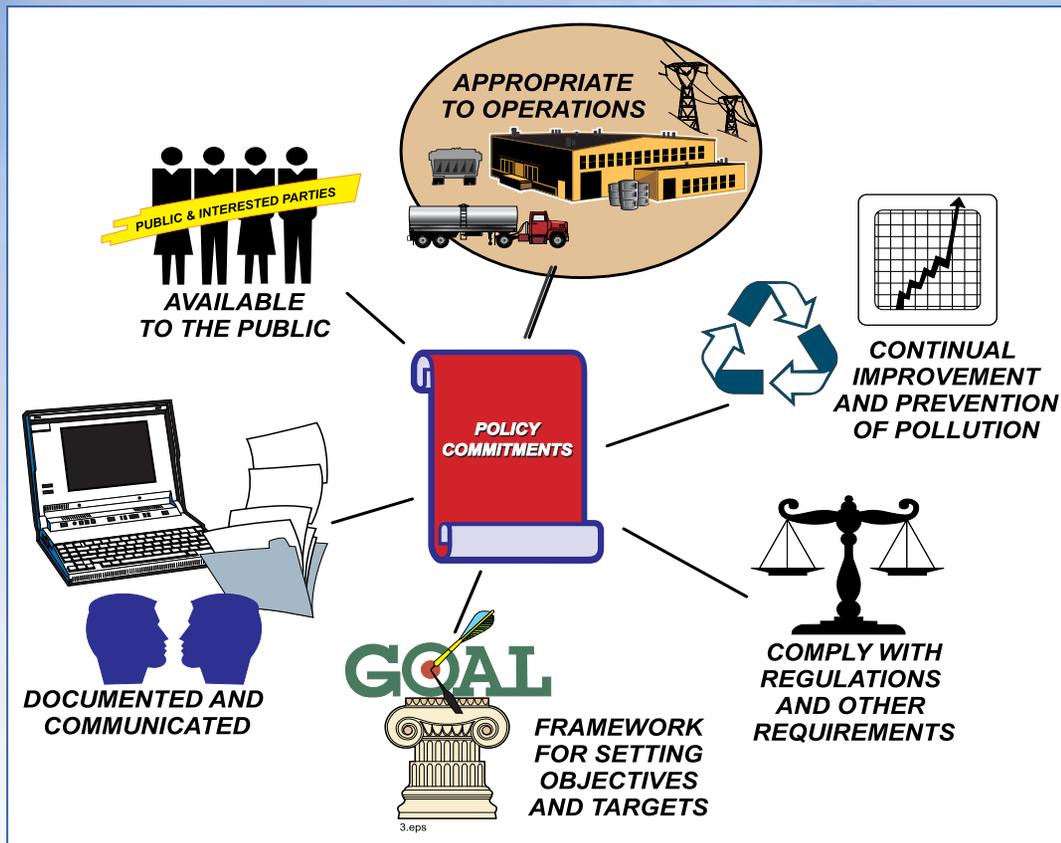
Policy  
4.2

Planning  
4.3

Implementation  
& Operations  
4.4

Checking &  
Corrective  
Action  
4.5

Management  
Review  
4.6



# Environmental Policy



Department of Energy  
Office of Environmental Management  
Portsmouth/Paducah Project Office

## ENVIRONMENTAL POLICY STATEMENT

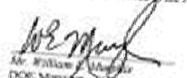
The U.S. Department of Energy's (DOE) Office of Environmental Management, Portsmouth/Paducah Project Office (PPPO), is committed to excellence and leadership in protecting the environment. It is the policy and practice of the PPPO to conduct its operations in a manner that protects human health and the environment and to be in full compliance with environmental laws, regulations, and other requirements. The PPPO accomplishes this by systematically and fully integrating environmental considerations into the planning and execution of work at all levels so that the mission of the PPPO is successfully accomplished for the benefit of the public, the worker, and the environment.

Executive Order 13148, *Greening the Government through Leadership in Environmental Management* assigns responsibility to the head of each Federal agency to ensure the integration of environmental accountability into day-to-day decision-making and long-term planning through the development and implementation of environmental management systems (EMS). Additionally, the DOE has made it clear that protection of the environment and the public is of paramount importance by requiring the integration of environmental programs into all work activities as stated in DOE Order 450.1 and must also be incorporated into the Integrated Safety Management Systems established pursuant to DOE Order 450.4.

Through employee involvement and management commitment to environmental excellence, the PPPO will:

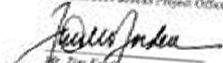
- Adhere to all environmental regulations and incorporate waste reduction and recycling into all daily operations at the lowest possible life-cycle cost.
- Control operations in a manner that reduces the hazards associated with the work being performed and use policies, prevention projects and activities to improve the PPPO environmental posture.
- Evaluate projects using up-front risk analyses to identify hazards, control these hazards through engineering design, and reduce or eliminate these hazards using waste minimization and pollution prevention techniques.
- Manage hazardous and radioactive materials and wastes generated from daily operations in a safe, compliant, and cost-effective manner. Establish and communicate environmental responsibilities, provide training, and implement controls.
- Involve workers in the development and execution of environmental management programs and objectively and fully communicate environmental information to the PPPO employees, contractors and subcontractors, stakeholders, and the public.
- Conserve natural resources by reusing and recycling materials and by purchasing and using environmentally preferable products.
- Integrate sustainability principles into the design and construction of new facilities and ensure energy efficiency is considered in each PPPO project and/or activity.

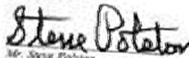
The PPPO seeks to demonstrate its corporate and environmental citizenship by continuously striving toward sustainability. Reaching environmental accountability will depend upon the commitment and contribution of each employee. We count on your support to achieve environmental excellence at the PPPO sites.

  
Mr. William A. Adams  
DOE Manager  
Portsmouth/Paducah Project Office

  
Mr. Roger M. Reynolds  
President & General Manager  
TPMC, LLC

  
Mr. Paul Kreutz  
Portsmouth, Project Manager  
CATA/Portliss Portsmouth, LLC

  
Mr. Tom F. Logan  
Project Manager  
Criterion Disposition Services, LLC

  
Mr. Steve Potatow  
Program Manager  
Swill & Suley Team

  
Mr. John Riccio  
Site Manager  
Paducah Remediation Services, LLC

# MOX Project Manager Signing Environmental Policy on Earth Day

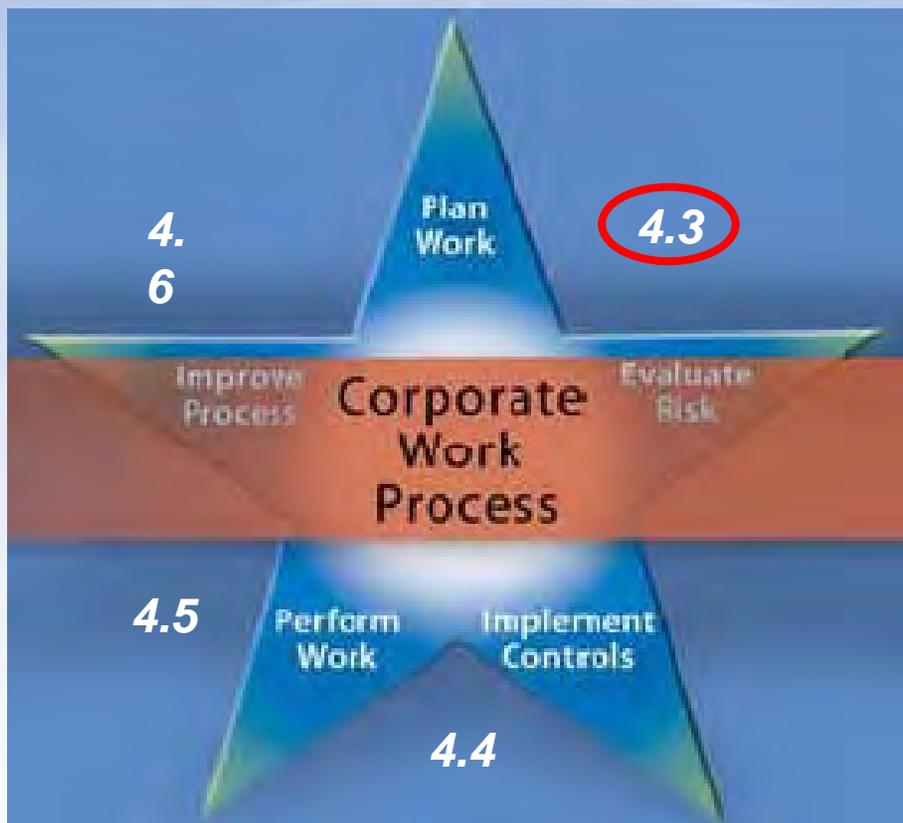


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# 4.3 Planning



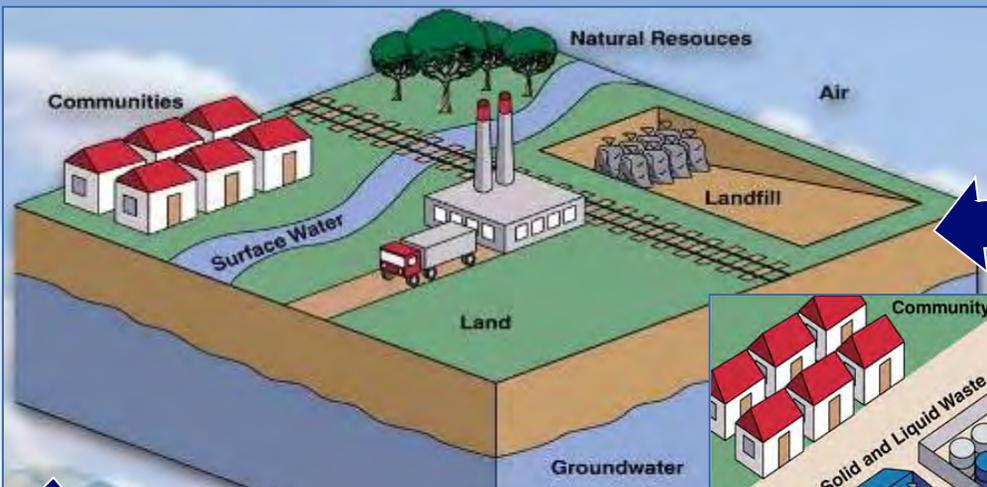
4.3.1 Environmental Aspects

4.3.2 Legal and Other Requirements

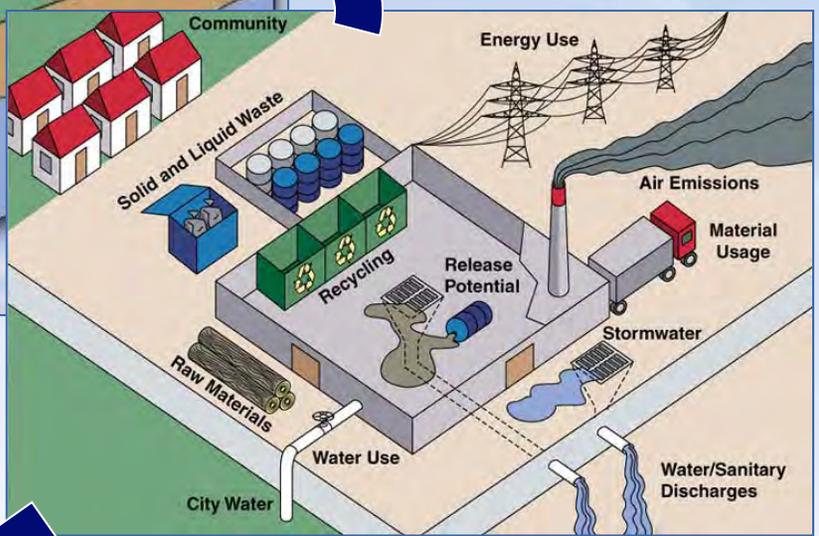
4.3.3 Objectives, Targets, and Programs

# Environmental Aspects – the backbone of the EMS

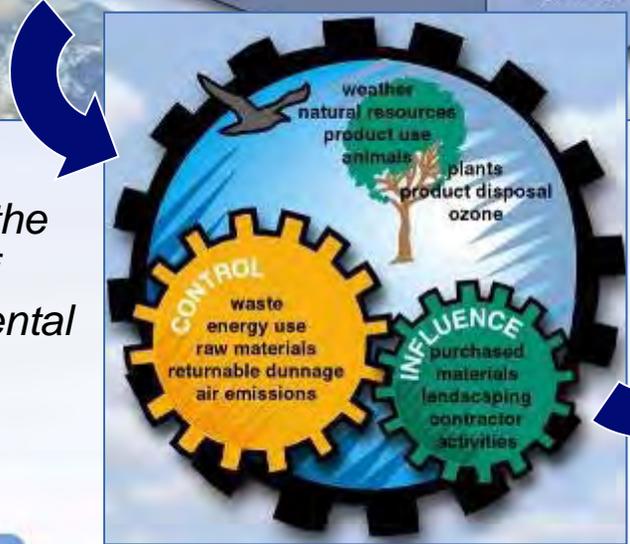
...for significant environmental impacts, or changes



Includes both positive & negative impacts



DOE activities, products, & services that interact with the environment

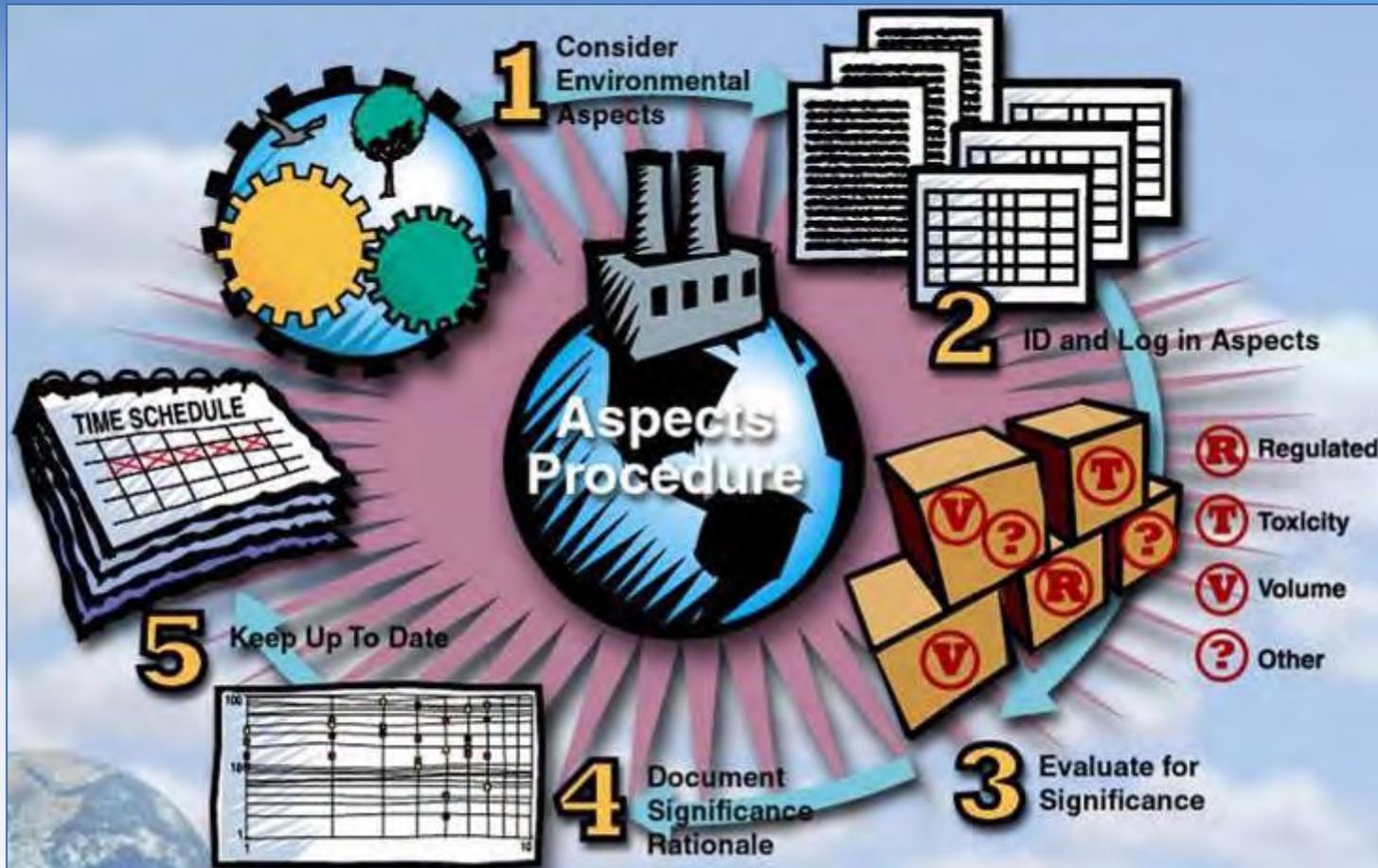


Consider the breadth of environmental aspects

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# 4.3.1 Environmental Aspects—what ISO requires



*ISO requires a procedure for select elements*

# Aspects and Impacts

- An **ASPECT** is a cause – an **element** of DOE's activities, products, or services that interacts with the environment and which an organization can control
- An **IMPACT** is the effect – any **change** to the environment whether adverse or beneficial, wholly or partially resulting from an organization's activities, products, or services

# Impacts

- Pollution or contamination
- Resource depletion
- Physical destruction of habitat
- Nuisance or cultural impact – noise, odors, historical, archeological, etc.

# Identifying Environmental Aspects

- First, identify major site work activities:
  - Experiments and Research
  - Operations (WWT, waste ops, treatment, maintenance, transportation)
  - Construction Activities
  - D&D
  - Office/administrative (cleaning, IT)
- Second, identify legal and regulatory obligations  
Permit Obligations (Title V, NPDES) or NEPA requirements

# Aspects and Impacts

## Activity

## Aspect

## Impact

(cause)

(effect)

• Building maintenance	Cleaning	Pollution/Contamination
• Research	Use of chemicals	Hazardous waste generation
• Building demolition	PCB removal	Regulated waste generation
• Construction	Use of raw materials	Resource depletion
• Transportation	Energy and Fuel Usage	GHG/pollution
• Wastewater treatment	Chemical usage/storage	Waste generation

# Example of Environmental Aspect and Impact



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# RMOTC Tensleep Formation – produces well water at 108° F



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# PORTS Mixed Waste



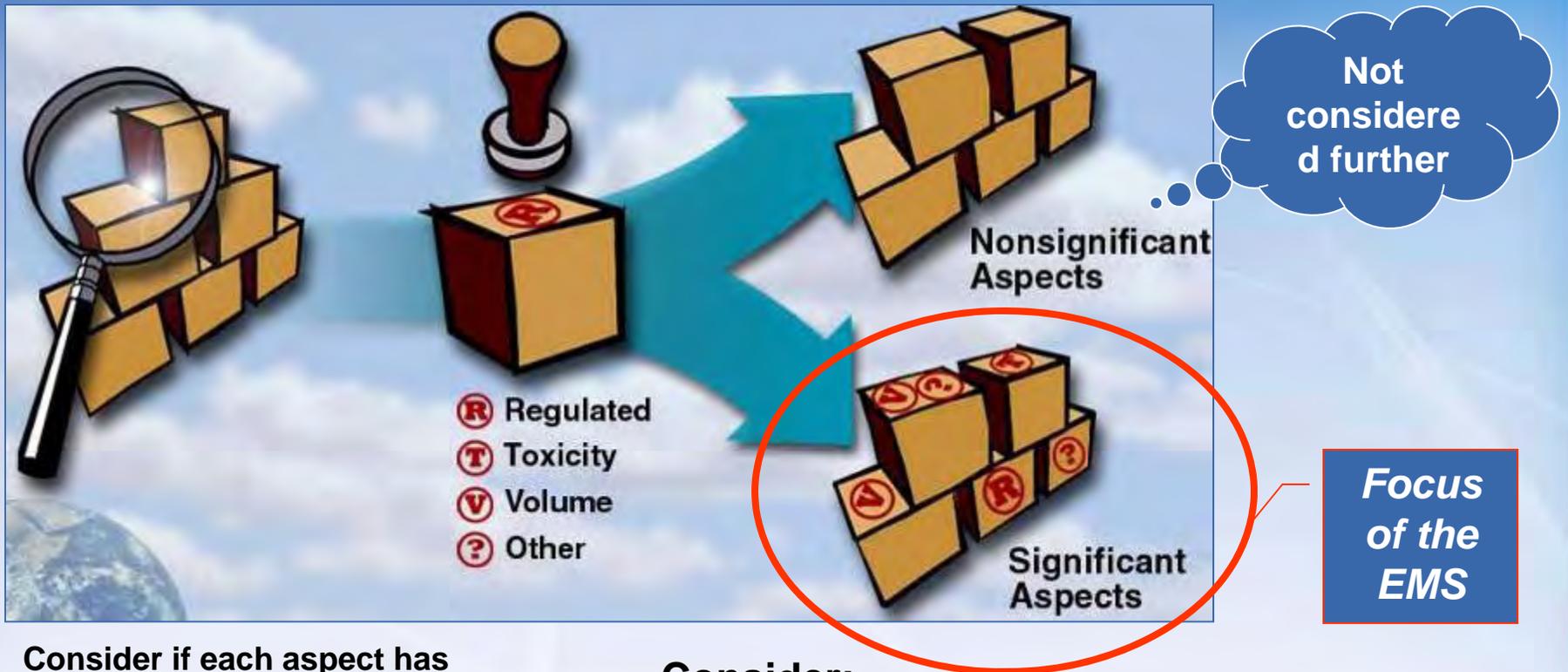
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# Significant Environmental Aspects— Prioritizing What’s Important for the Environment



Consider if each aspect has attributes that would make it “significant” (environmentally important), then rank to prioritize

## Consider:

Toxicity, Consumption of resource, Regulated/controlled/enforcement, Potential to be released, Specification, Frequency of episode, Volume or mass amts., Severity of impact

# Determining Significance

- Regulated aspects – laws, regulations, Executive Orders, DOE Orders, directives, RCRA part B permit
- Overall expense of aspect - energy or fuel costs
- High volume of waste
- Accident potential
- Health and safety concern
- Site mission
- No treatment or disposal pathway for waste
- Community/Stakeholder concerns
- Schedule delays

# Examples of Significant Environmental Aspects at DOE Sites

- Air Emissions
- Water Effluents
- Waste Management
- Floodplain/Wetlands
- Endangered Species
- Habitat Restoration
- Wildfire Management
- Wildlife Management
- Cultural Resource Management
- PCB Management
- Management of TSCA Chemicals
- UST Management
- EPCRA Reporting



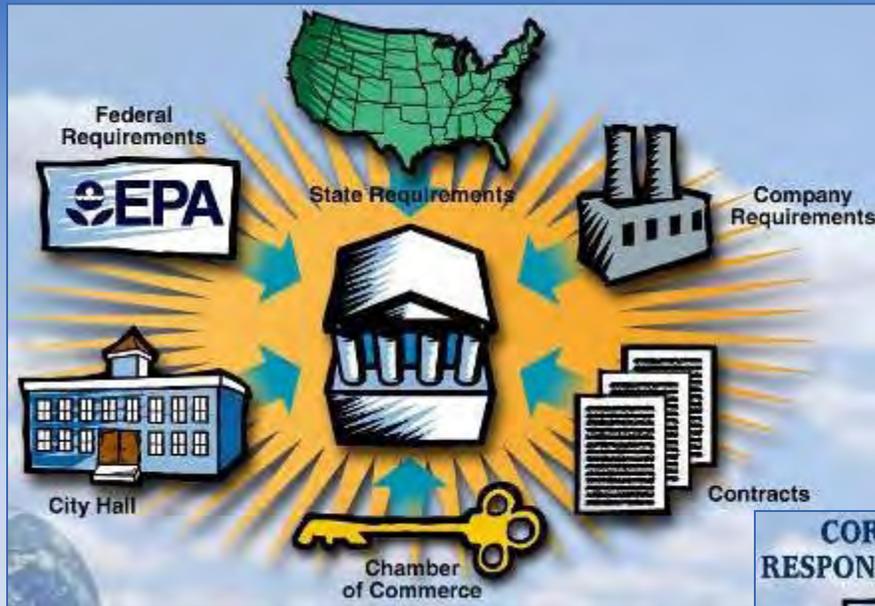
# Are you confused?

Some minds are like concrete...



thoroughly mixed up and permanently set

## 4.3.2 Legal & other requirements—what ISO requires



- *Identify legal and other requirements relevant to the management of DOE's environmental aspects*
- *Ensure these requirements are integrated into the EMS*
- *Establish a process to ensure the information is kept current*

***Document the established process within a procedure***



# Sources of Requirements

- Federal Requirements
  - In general , overseen by the EPA
  - NEPA, CAA, CWA, RCRA, CERCLA, etc.
- State Regulations
  - NPDES Permits
  - Storm water permits
  - RCRA Part B
- Local Regulations
  - Sewer Districts
  - Noise Ordinances

# Sources of OTHER requirements

- E.O. 13423
- DOE Order 450.1A
- DOE Order 430.2B
- DOE Order 450.4
- ISO 14001- 2004
- Contracts
- MOUs
- Federal Facility Agreements
- Consent Decrees (Tri-Party Agreement)

## 4.3.3 Objective, Targets & Programs—what ISO requires

- *Identify objectives (goals) and targets at relevant functions and levels*
- *Measurable where practicable*



*Objectives & Targets require the consideration of specific attributes*

- *Establish program(s) for achieving objectives and targets*
- *Define responsibilities, means, and time frame*

*Promotes good business planning*

# Objectives (Goals) & Targets

- Linked to DOE Site significant environmental aspects and should include DOE Environmental Sustainability Goals and DOE O Requirements
- Site-specific objectives included
- Quantitative targets, responsible and supporting organizations identified
- Organizations develop focused objectives & targets dependent on their operations



# Determining MEASURABLE Objectives and Targets

- Take the following into consideration:
  - Legal and other requirements
  - Site strategic planning process
  - Environmental policy commitments
  - Significant environmental aspects
  - Permit requirements (Title V, NPDES, RCRA part B)
  - Customer expectation/contractual commitments
  - DOE's Environmental Sustainability Goals
  - Mission performance
  - Results of PPOAs
  - Life-cycle costs
  - Previous years environmental performance
  - Results of EMS Management Review process



# Sustainable Environmental Stewardship Goals

- Reduce or eliminate the generation and/or toxicity of waste at the source through pollution prevention
- Reduce or eliminate the purchase, use, and release of toxic and hazardous chemicals and materials
- Maximize purchase and use of environmentally preferable products
- Reduce or eliminate environmental impacts of electronic assets
- Recycle post-consumer material



# Goal 1 - Reduce or eliminate the generation and/or toxicity of waste at the source through pollution prevention

- Sustainable practices:
  - Perform PPOAs
  - Fund the resources needed to implement goal
  - Participate in voluntary environmental partnership programs (National Waste Min Program, Waste Wise, National Environmental Performance Track)

## Goal 2 - Reduce or eliminate the purchase, use, and release of toxic and hazardous chemicals and materials

- Sustainable practices:
  - Employ tools such as Green Chemical Alternatives Purchasing Wizard
  - Maximize use of safe alternatives to ozone depleting substances (ODS)
  - Use environmentally benign solvents and solvent-less systems
  - Implement chemical inventory tracking system

# Goal 3 - Maximize purchase and use of environmentally preferable products

- Sustainable Practices:
  - Specify EPP in acquisition of supplies and services
  - Procure recycled-content and bio based products, Energy Star®-labeled and FEMP-labeled products, EPA Significant New Alternatives Policy (SNAP) substitutes for ODS, and others such as Green Seal® cleaning products, etc.
  - Integrate EPP into new construction and major renovation projects (DOE O 413.3A – *Program and Project Management for the Acquisition of Capital Assets*)



## Goal 4 - Reduce or eliminate environmental impacts of electronic assets

- Sustainable Practices:
  - Utilize EPEAT for purchase of electronics
  - Enable Energy Star® feature – power management
  - Extend useful life of computer systems thru software upgrades
  - Reuse surplus and recycle end-of-life electronics
  - Specify take-back provisions in contracts for leased electronics



## Goal 5 - Recycle Post-Consumer Material

- Sustainable Practices:
  - Recycle office paper, cardboard, aluminum, plastics, glass
  - Recycle spent oil, hydraulic fluids, lubricants, solvents, batteries
  - Recycle construction and demolition debris
  - Collect spent toner cartridges
  - Recycle surplus commodities and by-products and unwanted materials

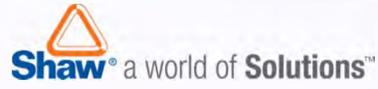




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# Example Objective and Target – Hazardous Waste Generation



*Objective*

**Reduce hazardous wastes**

*Target*

**Reduce solvent wastes by 20% and electro polishing wastes by 10%**

# Example Objective and Target – Wastewater Generation



*Objective*

**Reduce process  
waste water  
generation**

*Target*

**Reduce process  
waste water  
generation by 25%**

# Example Objective and Target – Chemical Usage



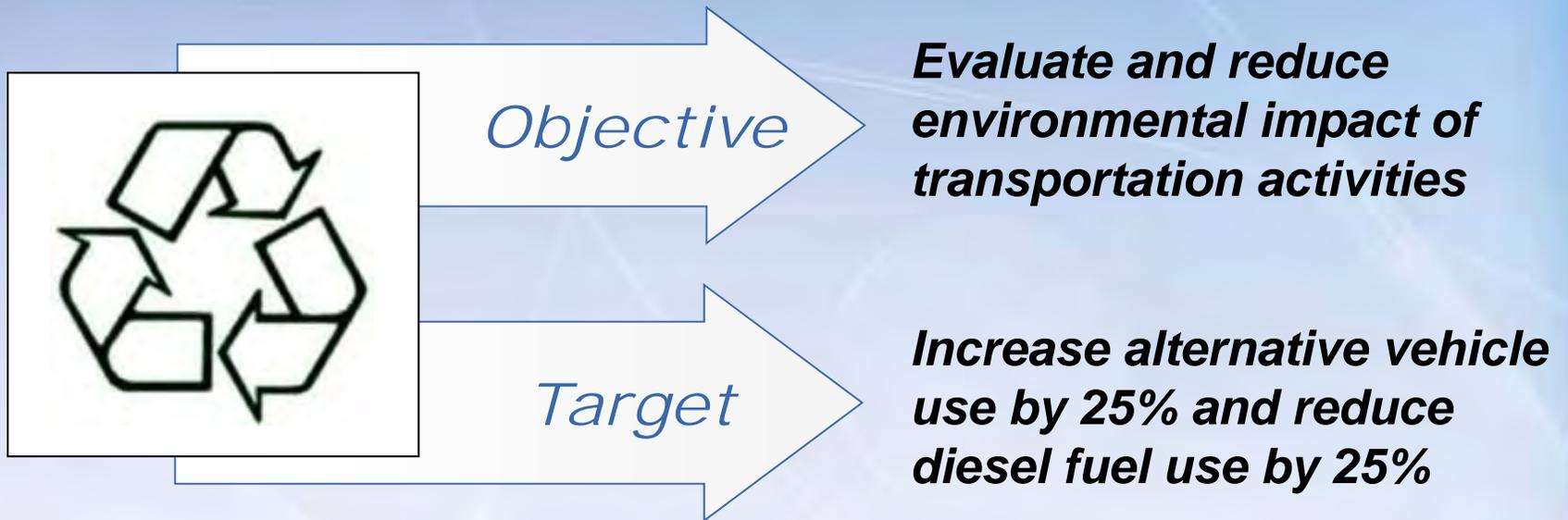
*Objective*

***Reduce purchase and storage of excess, unused chemicals***

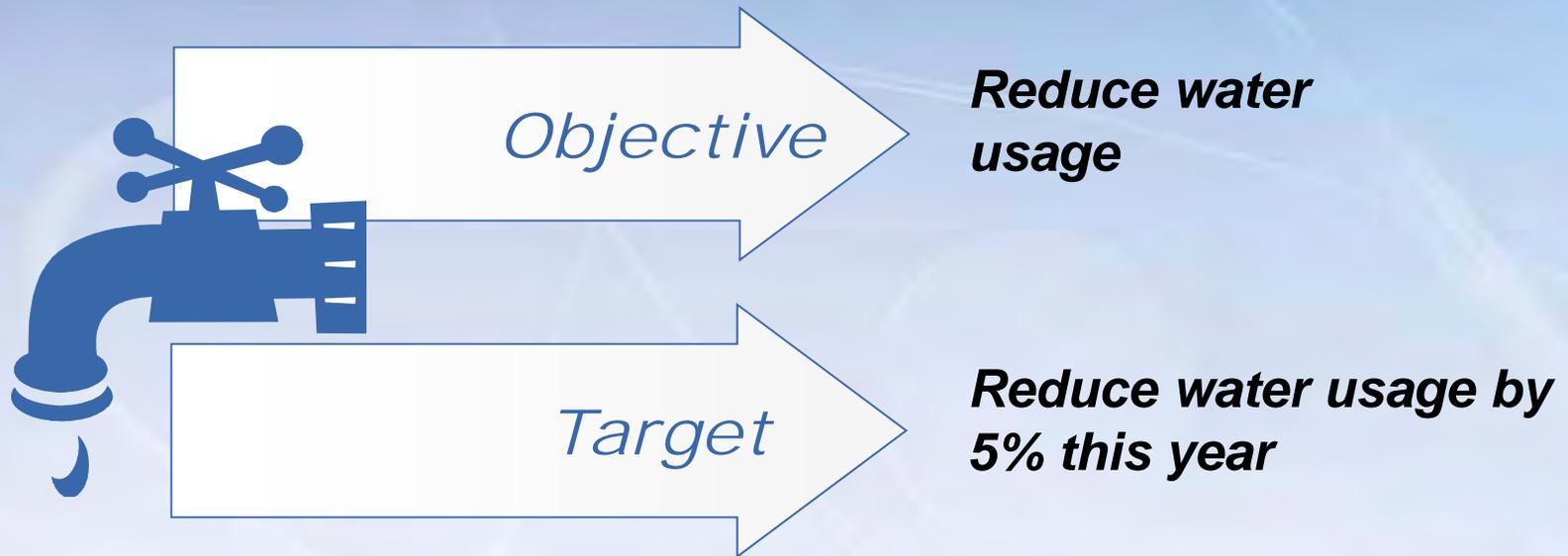
*Target*

***Utilize a Chemical Management Center for potential chemical reuse instead of purchase; reduce NEW purchases by 10%***

# Example Objective and Target – Diesel Fuel Usage



# Example Objective and Target – Water Usage



# Example Objective and Target – Energy Consumption



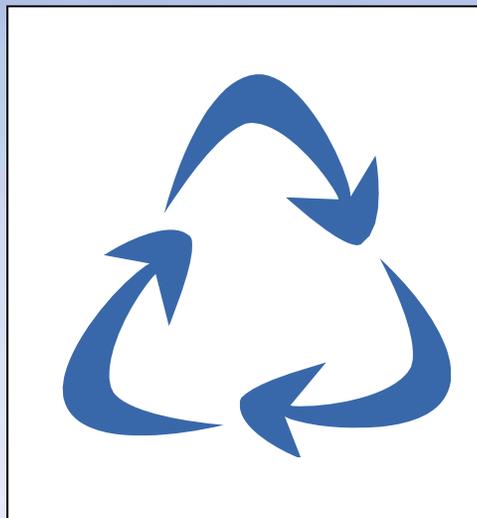
*Objective*

***Reduce energy consumption***

*Target*

***Reduce energy consumption by 10% in office buildings***

# Example Objective and Target – Recycle Debris



*Objective*

***Reduce Environmental Impact of Activities***

*Target*

***Recycle 10% more construction and demolition debris per year***

# Example Objective and Target – EPP Purchases



*Objective*

***Maximize purchase and use of environmentally preferable products***

*Target*

***Purchase and use 10% more bio-based and recycled-content products than previous year***

# Comprehensive Procurement Guide (CPG) Recycled Content Product Categories

- Paper and paper products
- Vehicular
- Construction
- Transportation
- Parks and recreation
- Landscaping
- Non-paper office products
- Miscellaneous



# Bio based Products

- A commercial or industrial product (other than food or feed) that utilizes biological products or renewable domestic agricultural (plant, animal, and marine) or forestry materials
  - Examples: Strawboard walls  
Soy-based lubricating oils  
Bio-diesel fuel



# Environmental Programs

- Develop and maintain programs (Action Plans/Environmental Program Plans) to achieve the Objectives and Targets
- Designate responsibilities
- Establish specific time-frame for implementation

# Environmental Program Plans -examples

- P2/WMin Plans
- ODS Management Plans
- Hazardous Waste Management Plans
- Solid Waste Plans
- Cultural Resource Plans
- Storm water P2 Plans
- Natural Resource Management Plans
- Air Monitoring Plans
- Energy and Water Conservation Management Plans

# Programs for Grizzly Management



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# NPR-3 Petroglyphs – Cultural Resource Management Plan



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# RMOTC Sheep Grazing – Range Management Plan



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# Okay – How can we work together to meet the objectives and targets?



# 4.4 Implementation & Operations

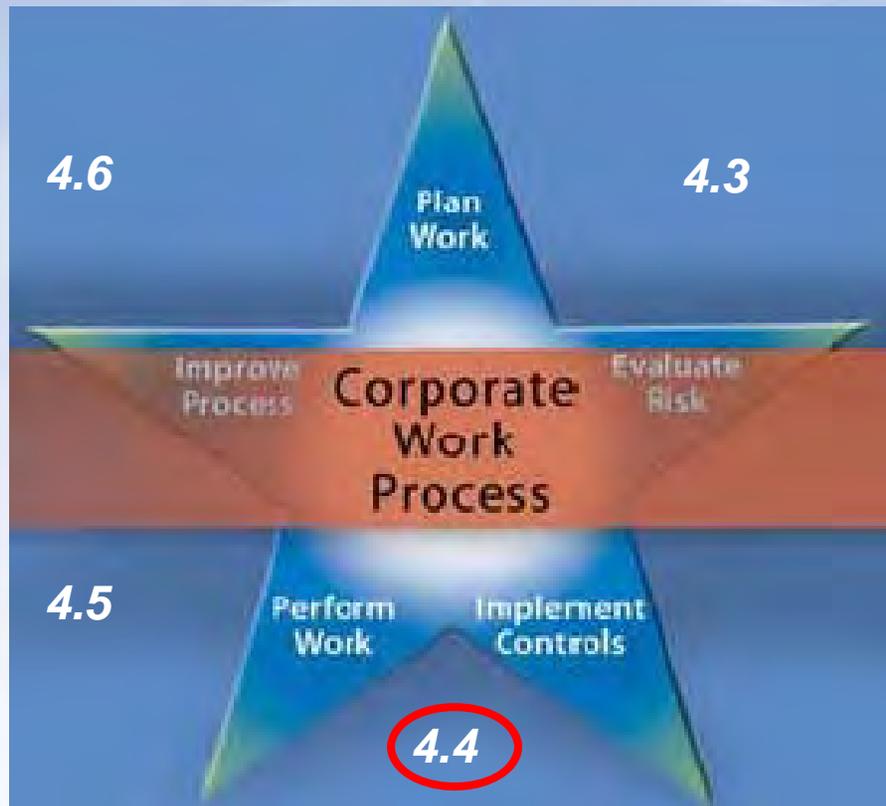
Policy  
4.2

Planning  
4.3

Implementation  
& Operations  
4.4

Checking &  
Corrective  
Action  
4.5

Management  
Review  
4.6



4.4.1 Resources, roles, responsibility & authority

4.4.2 Competence, training & awareness

4.3.3 Communication

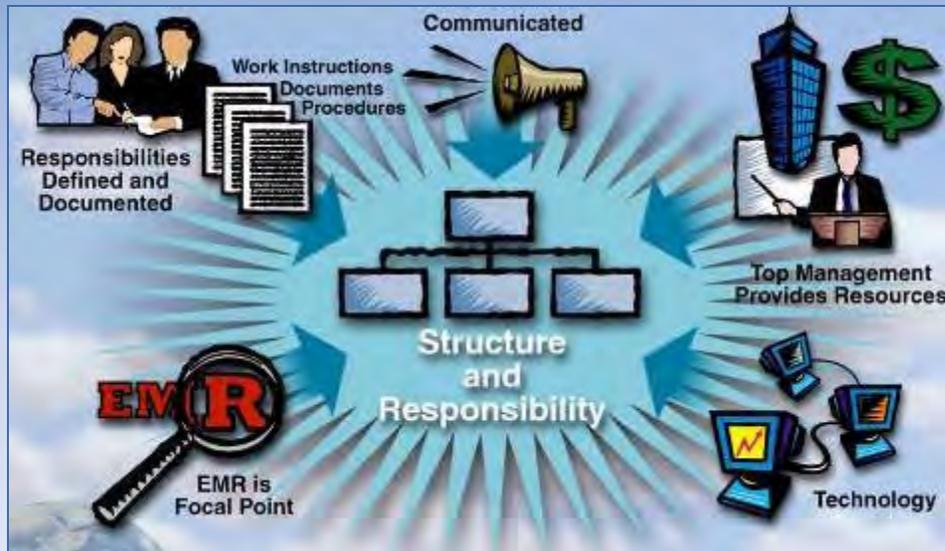
4.4.4 Documentation

4.4.5 Control of documents

4.4.6 Operational control

4.4.7 Emergency Preparedness & Response

## 4.4.1 Resources, Roles, Responsibility and Authority



Structure and responsibility typically integrated into the organization's existing structure

ISO requires a procedure for select elements

*ISO requires systematic approach to the assignment of resources*

- Senior Management
- Support Staff
- Operations Management
- Workforce

Promotes good business planning

## 4.4.2 Competence, Training, & Awareness

*Procedure(s) to define the training process for persons working for or on behalf of the organization*



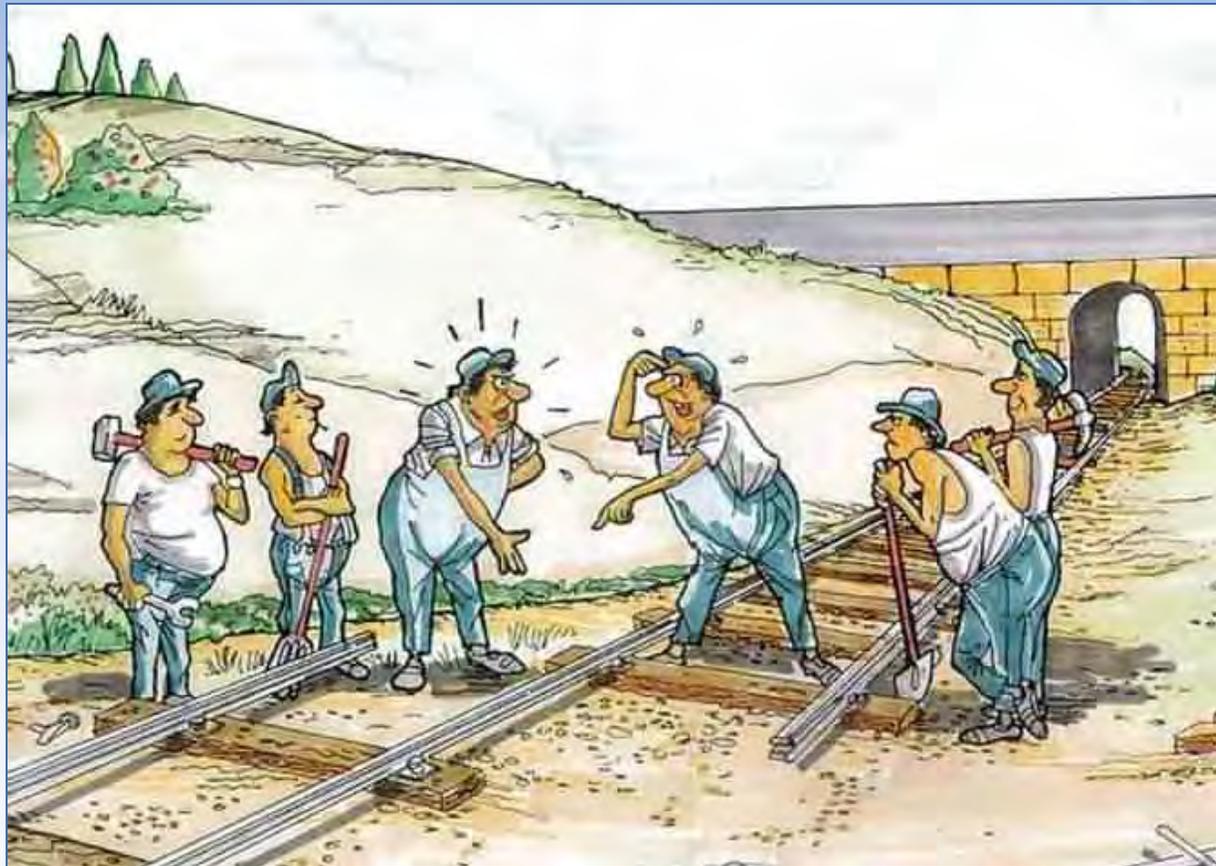
**People with the potential to cause a significant impact must be competent by training, education, and associated records retained**

**Procedures / training need to:**

- **include the importance of conformance with the policy, procedures, and EMS requirements**
- **significant environmental aspects, potential impacts, benefits of improved personnel performance**
- **EMS roles & responsibilities**
- **potential consequences of departure from procedures**

Manage through existing site training protocols while developing some new content

# Let's Communicate!



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## 4.4.3 Communication

*ISO requires procedure(s) to define internal and external communications*



*Communication channels typically include:*

- *Bulletin Board Displays*
- *E-mails*
- *Internal & External websites*
- *Meetings*
- *Environmental Lessons Learned*
- *Training*

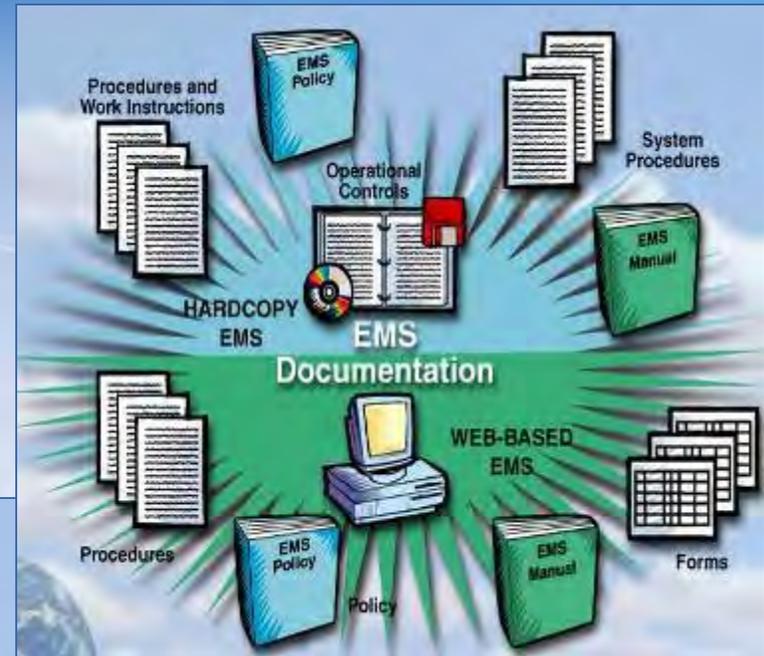
*Awareness campaign helps increase the visibility of the EMS and personal responsibilities*



# 4.4.4 Documentation

**ISO requires documentation of the EMS:**

- **environmental policy, objectives, targets**
- **description of the scope of the EMS**
- **description of the main elements of the EMS, their interaction, and reference to related documents**
- **documents, including records, relevant to the EMS**

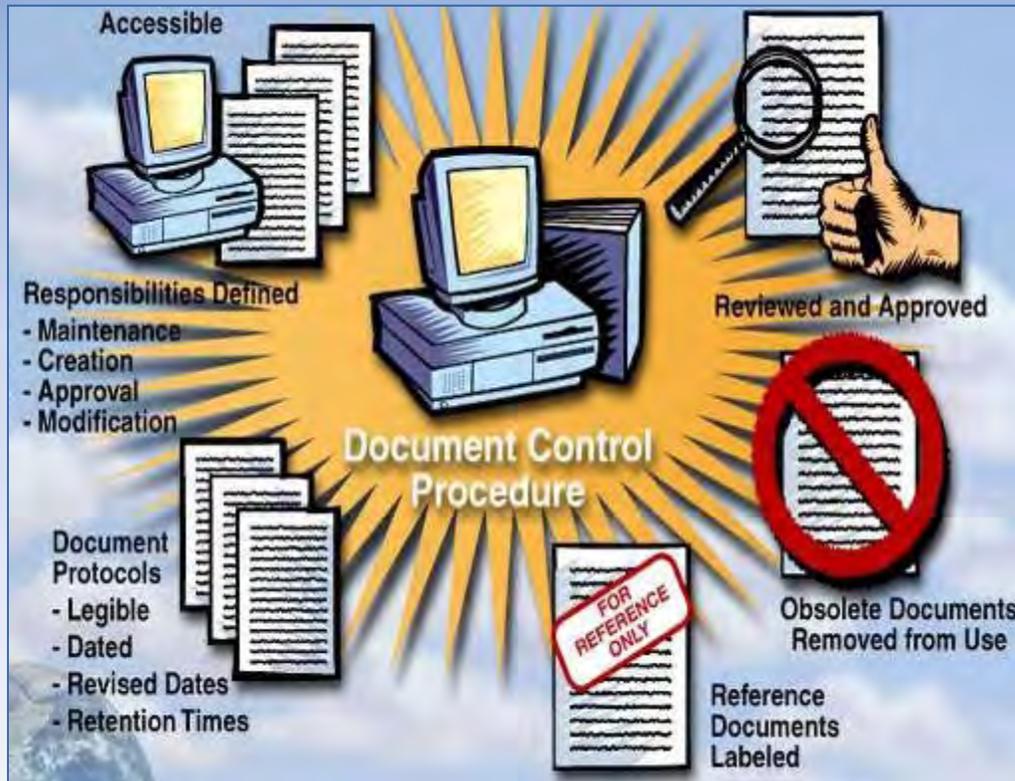


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## 4.4.5 Document control

*ISO requires procedure(s) to define how EMS documents are controlled*



*Implementation is typically managed through existing requirements*

- Read only access for most, limited write privileges

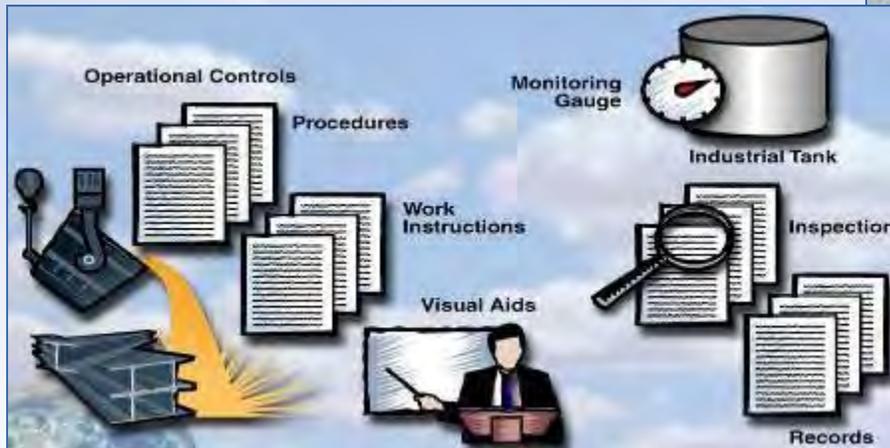
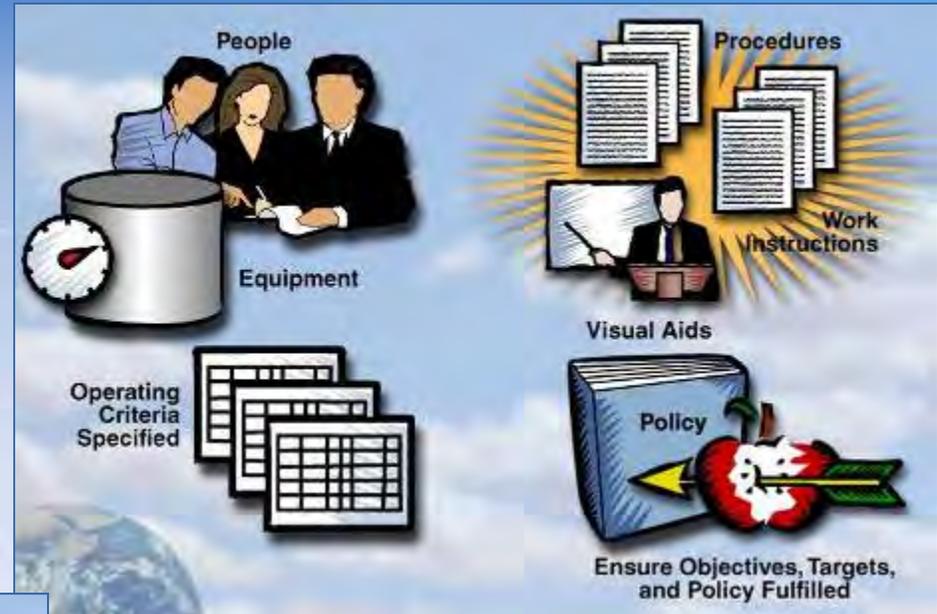
*Documents of external origin important to the EMS must be managed as controlled documents*

What if the  
'HOKEY POKEY'  
Really Is What  
It's All About?

# 4.4.6 Operational control

*ISO requires that operations associated with significant environmental aspects:*

- *documented procedures to control situations where their absence could lead to deviations from the policy, objectives, & targets*
- *operating criteria stipulated in procedures*
- *communicating applicable procedures and requirements to suppliers, including contractors*



**Important considerations for managing your significant aspects**

- **People & equipment involved**
- **Work Instructions detail how work is done**
- **Policy and objectives & target commitments**
- **Augment existing documents**
- **Informal practices**
- **Contractor management**

# 4.4.6 Operational Control

## Requirements for contractor management program

The Program requires cooperation and coordination between DOE, Contractors, AND subcontractors

Performance expectations must be communicated to contractors & suppliers prior to work being initiated.



Environmental performance requirements should be part of the CRD.

# 4.4.6 Operational Control

## Contractor significance considerations: Solid and liquid wastes and recycling

Do work activities generate wastes or recyclables?

**Solid Waste**

**Hazardous Waste**

**Liquid Wastes**

**Recyclables**

Do you plan to dispose of your wastes on-site?

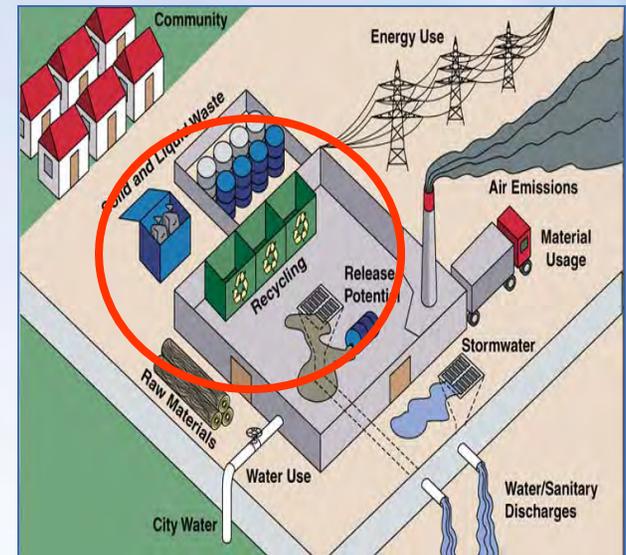
If so, you may require permission and guidance

Are you taking wastes off-site?

Are you familiar with the regulations for disposal?

Can the waste materials be recycled?

By you or the plant?



# RMOTC Oil Production Facility



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# Oxidant Injection GW Treatment



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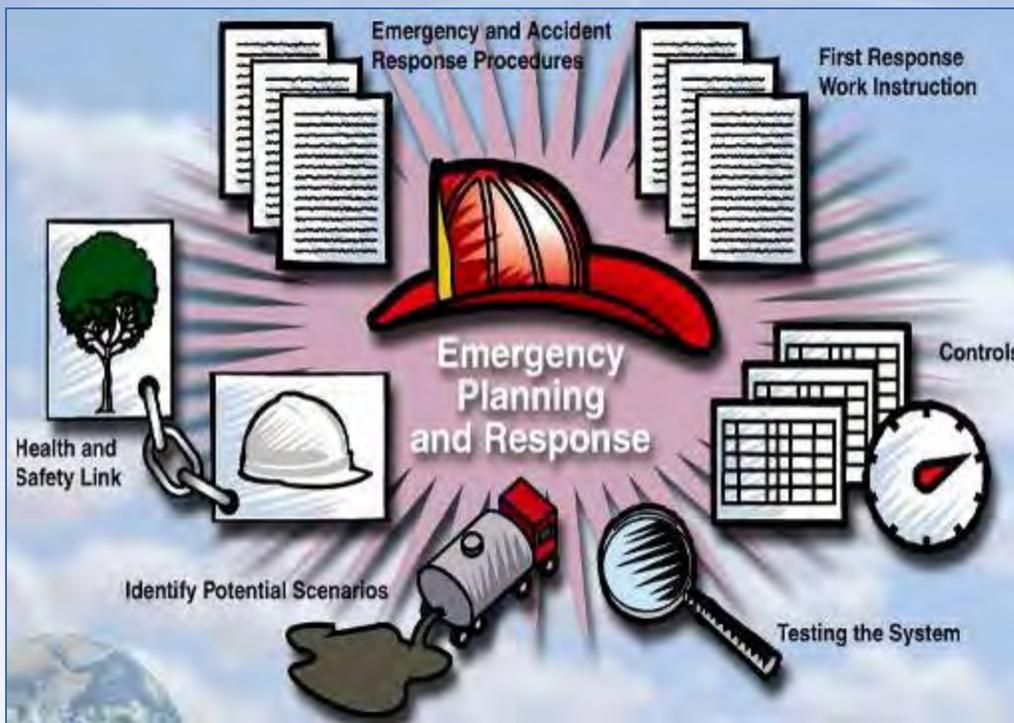
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## 4.4.7 Emergency Preparedness & Response

*ISO requires the consideration of emergencies and how they will be managed.*



*Implementation is managed through existing requirements*

- First Responders
- Environmental Management Programs
- Regulatory-required plans (SPCC, SW3P)

Give consideration to viable emergencies associated with significant aspects

# RMOTC Wild Fire Training Exercise



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# 4.5 Checking & Corrective Action

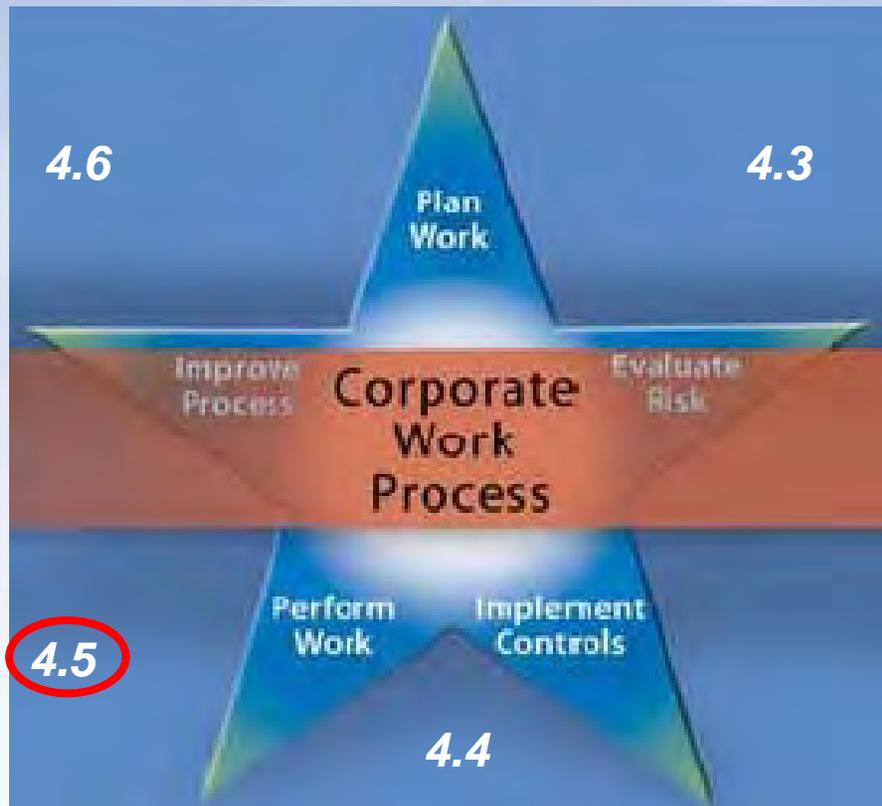
Policy  
4.2

Planning  
4.3

Implementation  
& Operations  
4.4

Checking &  
Corrective  
Action  
4.5

Management  
Review  
4.6



4.5.1 Monitoring & measurement

4.5.2 Evaluation of compliance

4.5.3 Nonconformance, corrective, and preventive action

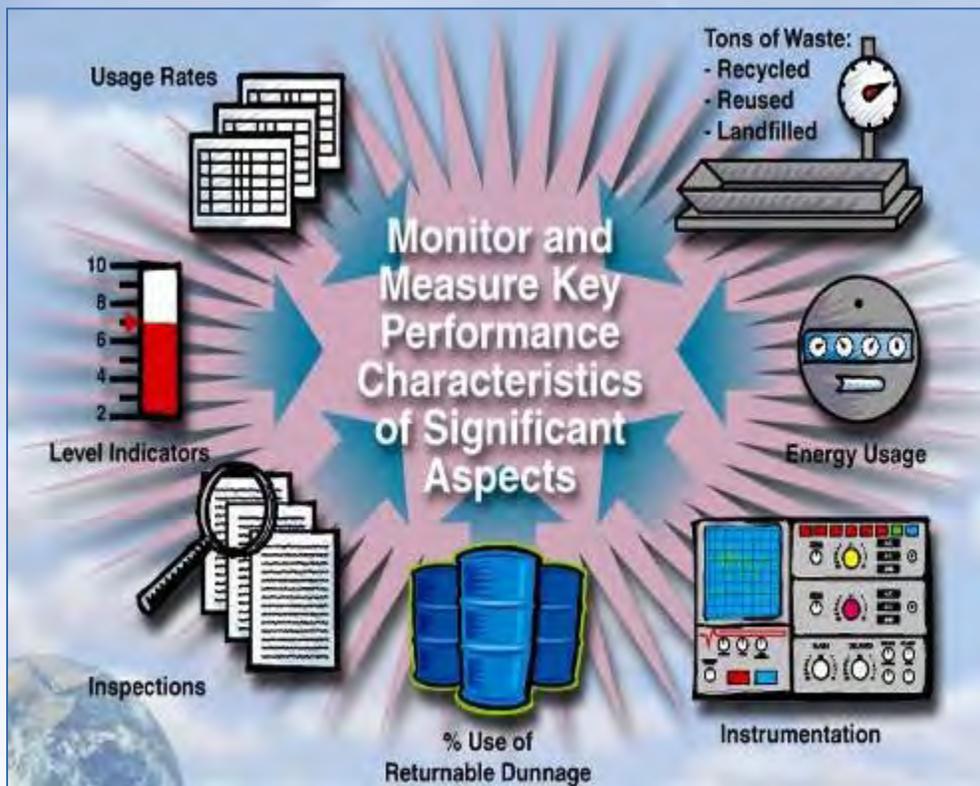
4.5.4 Records

4.5.5 EMS Audits

# 4.5.1 Monitoring & measurement

*ISO requires the monitoring & measurement of key attributes associated with operations that can have a significant environmental impact to ensure objectives and targets can be supported*

*Meaningful monitoring and measurement programs provide metrics to assess environmental, financial, and operational performance*



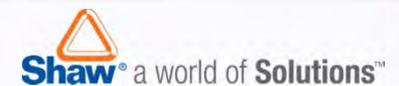
- Initially, rudimentary metrics
- Increasing levels of sophistication
- Key performance indicators
- Opportunity to demonstrate program value
- What can be measured can be managed

Ensure measuring equipment is properly calibrated to ensure data integrity

# PORTS Monitoring Effectiveness of Phyto-Remediation Remedy at TCE Groundwater Plume



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# 4.5.2 Evaluation of Compliance

**ISO requires a procedure for periodically evaluating compliance with applicable legal and other requirements and maintain records of the results**



**Compliance audits are integral to demonstrate the commitment to compliance and continual improvement**

- Compliance audits are to be performed annually or more frequently per other requirements.

Audit program must include "other requirements to which the organization subscribes"

# DOE's Environmental Compliance Improvement Audit and Review Program

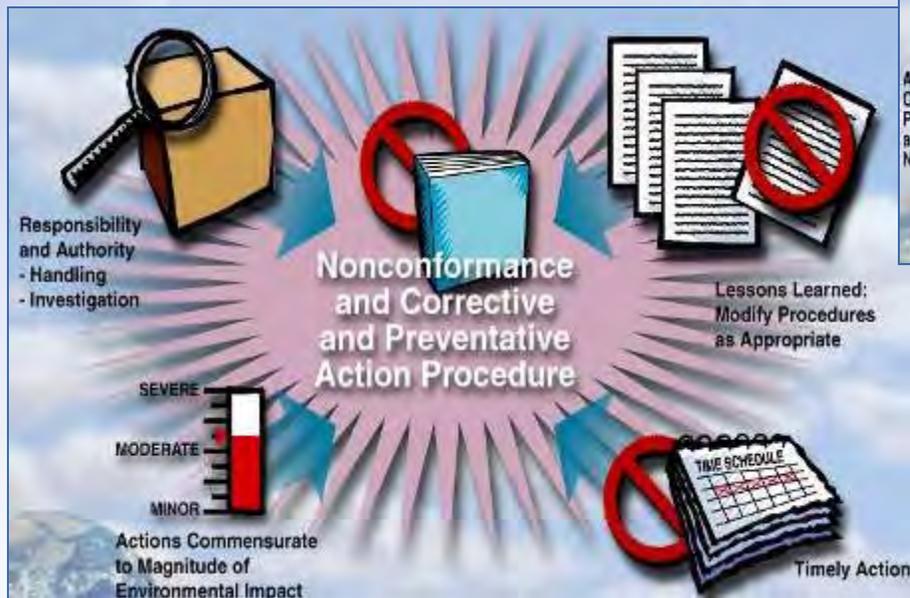
- DOE O 450.1A requires that EMS contain an environmental compliance audit and review program that IDs compliance deficiencies and root causes of noncompliance
- *DOE Implementation Guide for Developing an Environmental Compliance Improvement Audit and Review Program* is in REVCOM
- Compliance audits typically tie into site audit programs developed under DOE O 226.1A – Implementation of DOE Oversight Policy

# Key Elements of an Environmental Compliance Management Plan or Procedure

- Statement by senior management that they are committed to achieving and maintaining compliance – typically in environmental policy statement
- Clearly articulated roles and responsibilities related to environmental performance in organization to ensure accountability
- Compliance deficiencies are identified, analyzed for root causes and/or trends, and corrective actions are developed
- Compliance audit findings and corrective actions are tracked and resources are allocated for the corrective actions

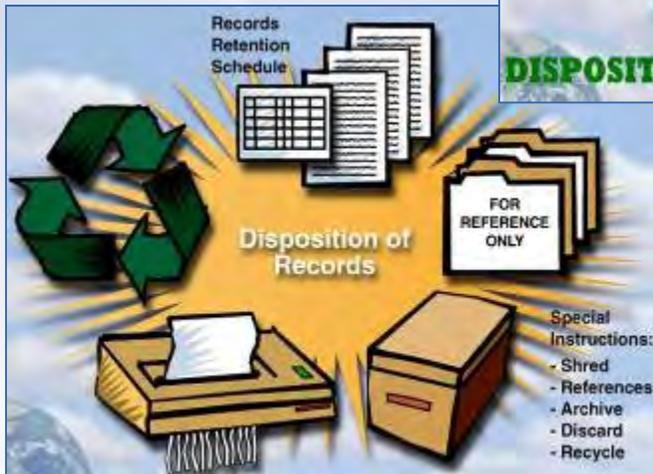
# 4.5.3 Nonconformity, corrective action and preventive action

*ISO requires a procedure for managing the nonconformance, corrective and preventive action process to ensure necessary changes are made to the EMS*



# 4.5.4 Control of Records

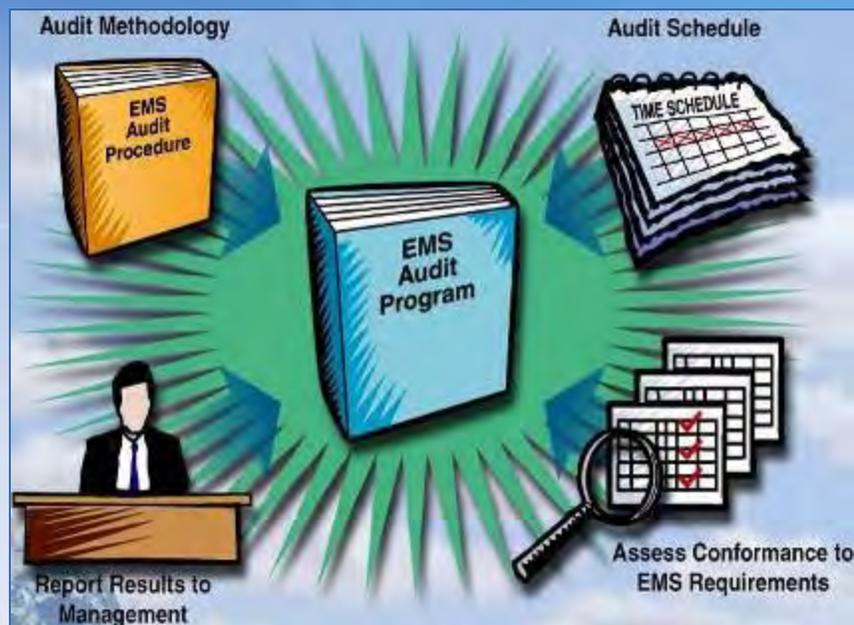
*ISO requires a procedure for records management. Records must be maintained to demonstrate conformity to the requirements of the EMS and results achieved.*

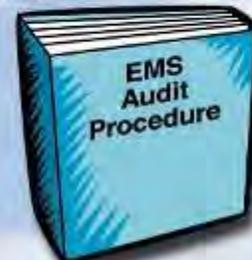


# 4.5.5 Internal Audit

**ISO requires an audit program, to include a documented procedure. Internal audits are intended to:**

- **determine if the EMS conforms to the ISO 14001 standard**
- **properly implemented**
- **results reported to management**



<p><b>Audit Scope</b></p> <ul style="list-style-type: none"> <li>- What is covered</li> <li>- Procedures/work instructions</li> <li>- System requirements</li> </ul>	<p><b>Audit Frequency</b></p> <ul style="list-style-type: none"> <li>- System requirements</li> <li>- Individual departments</li> <li>- Regulatory compliance</li> </ul>
	
<p><b>Responsibilities</b></p> <ul style="list-style-type: none"> <li>- Internal auditors</li> <li>- Qualifications</li> <li>- Training</li> <li>- Reporting</li> <li>- Corrective action</li> </ul>	<p><b>Audit Frequency</b></p> <ul style="list-style-type: none"> <li>- Audit team</li> <li>- Notifications</li> <li>- Check lists</li> <li>- Audit reports</li> <li>- Corrective action</li> <li>- Reporting</li> </ul>



# Conducting Audit – Observe Operations



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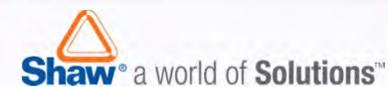
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# Would YOU want this Team Auditing your Site?



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# Types of EMS audits

- 1st Party Audits
  - Completed by internal resources
  - Commonly focus on specific activities and processes
- 2nd Party Audits
  - Completed by resources independent of the organization
  - May focus on specific processes or system requirements
- 3rd Party Audits
  - Completed by independent “registrar” auditors (e.g., NSF, Lloyds)
  - Assess conformance to system requirements – if ISO 14001 certified have conformance audit every 3 years

# 4.6 Management Review

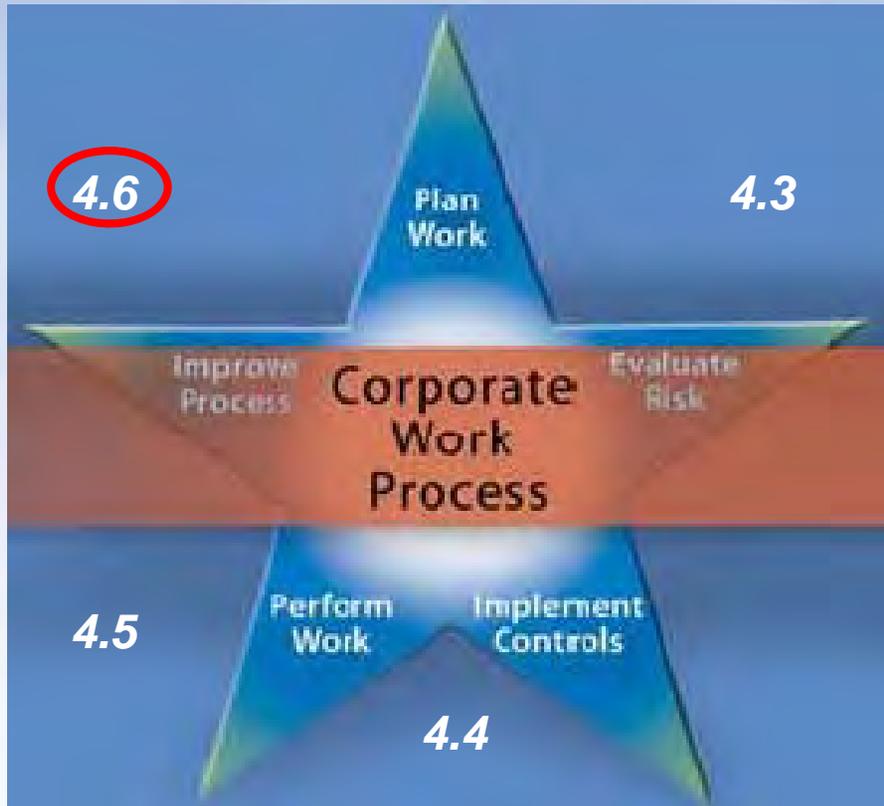
Policy  
4.2

Planning  
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& Operations  
4.4

Checking &  
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4.5

Management  
Review  
4.6



# 4.6 Management review

**ISO requires top management to conduct a documented review the EMS to ensure its suitability, adequacy, and effectiveness. Inputs must consider:**

- **results of internal audits**
- **communication from external parties**
- **environmental performance**
- **extent to which objectives met**
- **status of corrective and preventive actions**
- **follow-up from previous reviews**
- **changing circumstances**
- **recommendations for improvement**



**Many sites use Annual ISMS Review to fulfill this requirement.**

**Outputs to meet ISO need to include decisions and actions related to possible changes to the:**

- **policy**
- **objectives and targets**
- **other elements of the EMS**

# Management Review Team



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# These people look scary!



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# ISO 14001 Overview is FINISHED

Silence is golden



Duct tape is silver

# DOE-Specific EMS Validation Process

- DOE managers are to declare DOE EMS's in conformance (fully-implemented) with DOE O 450.1A requirements by **June 30, 2009**
- How do you go about “declaring” conformance to the Executive Order?

# DOE O 450.1A Requirements for Declaring a “Fully Implemented” EMS

- Formal audit by a qualified party outside the control and scope of the EMS
- Appropriate contractor senior management and DOE field office management have recognized and addressed audit findings
- Appropriate senior manager accountable for EMS implementation and the cognizant Field Office Manager have declared conformance to the requirements of DOE O 450.1A

# What is a FORMAL AUDIT?

- Includes an audit plan with scope and schedule
- Review of background documents – policy, significant aspects, objectives and targets, plans, etc.
- Physical audit of facility to determine conformance with standard, consistency between elements, and continual improvement
- Formal audit report detailing findings
- Out-briefing with senior managers

# Goals of the Formal Audit

- Ensure EMS is implemented according to ISO 14001:2004 standard
- Implementation is consistent across all elements
- Opportunities for improvement are identified and pursued
- Ensures credibility and accountability is maintained

# What is a QUALIFIED PARTY?

- Competent and relevant skills to carry out audit
- Working knowledge of ISO 14001:2004 and appropriate DOE Orders
- General science and technology educational background
- Regulatory and legal requirements knowledge
- Formal ISO 14001 Lead Auditor training recommended, but not required

# What does OUTSIDE the SCOPE or CONTROL of EMS mean?

- Audit must be performed as an unbiased and objective review of the EMS
- Auditors should not have been involved in the development or day-to-day implementation of the EMS being reviewed
- Auditors should not have worked in the organization where the EMS was developed or implemented or had responsibilities associated with the EMS
- Auditors could be a DOE HQ audit team, consultants, federal voluntary program, or other federal organization

# What does it mean that the FINDINGS of the formal audit have been RECOGNIZED and ADDRESSED?

- EMS has been through one full cycle of implementation
- EMS is suitable, adequate, and effective and has been explained to senior management
- Minor non-conformances have corrective actions identified, planned, and endorsed by senior management
- Major non-conformances (systemic issues or totally missing EMS elements) lead to non-conformance and no formal declaration

# Declaring CONFORMANCE

- Declare conformance after findings (minor non-conformances) from audit are recognized by management and corrective actions are endorsed
- Senior manager responsible for EMS declares conformance with E.O. 13423
- Declaration may be in form of signed statement or letter affirming EMS has been properly developed and implemented
- Consider making these statement available to the public

# Current Status of EM EMSs

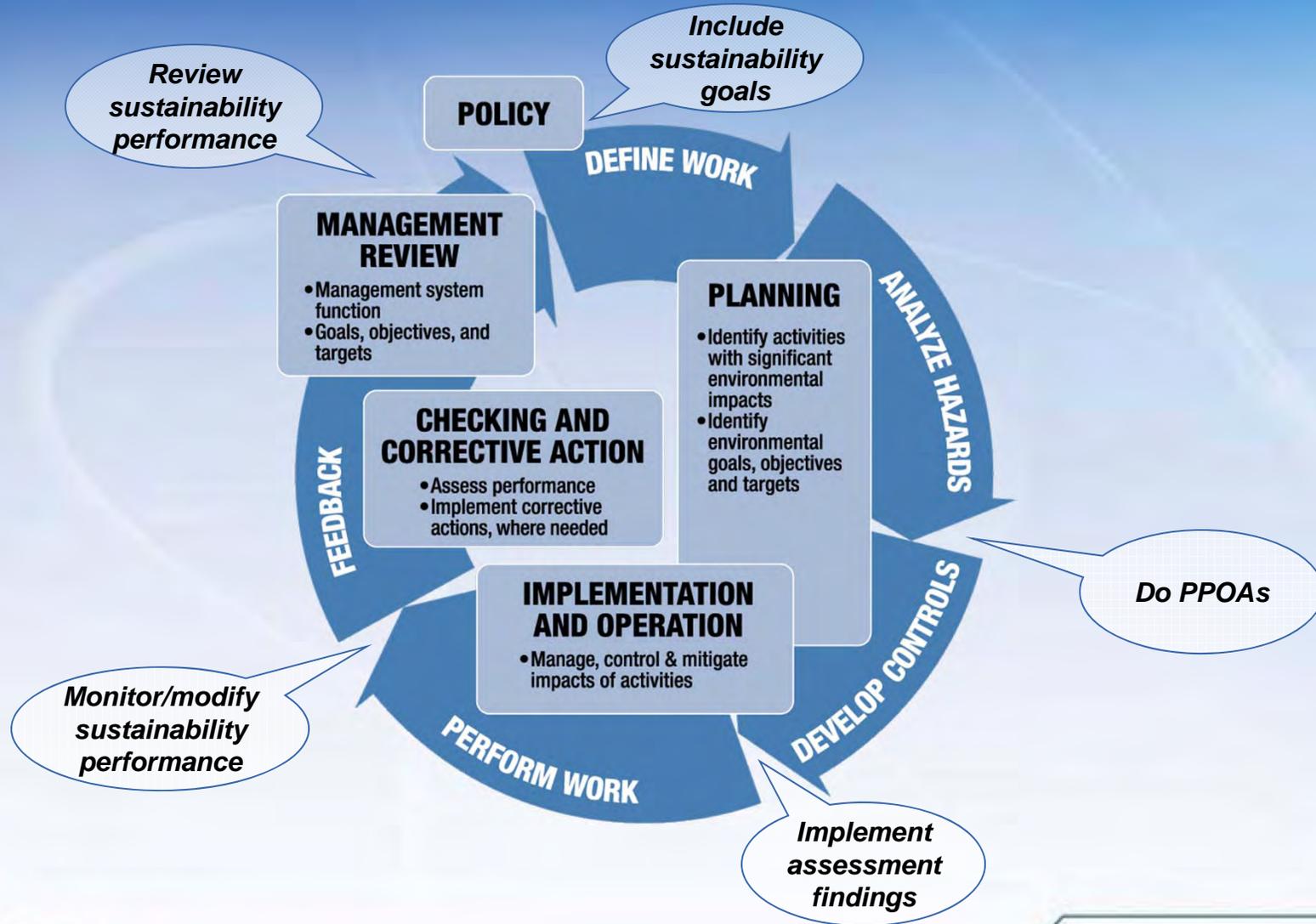
<b>ETTP</b>	<b>June 30, 2009</b>	
<b>Hanford – Central Plateau</b>	<b>December 2009</b>	<b>New contract - PRC</b>
<b>Hanford – River Corridor</b>	<b>December 2009</b>	<b>New Contract - WCH</b>
<b>Hanford – River Protection</b>		<b>New Contract - WRPS</b>
<b>Idaho – Advanced Mixed Waste Treatment</b>	<b>June 30, 2009</b>	
<b>Idaho Cleanup Project</b>	<b>June 30, 2009</b>	
<b>Paducah Site</b>	<b>June 30, 2009</b>	
<b>Portsmouth Site</b>	<b>June 30, 2009</b>	
<b>SRS</b>	<b>June 30, 2009</b>	
<b>WIPP</b>	<b>June 30, 2009</b>	
<b>West Valley Demonstration</b>	<b>June 30, 2009</b>	

# EMS Integration with ISMS

- DOE O. 450.1A requires EMS be integrated into ISMS
- Most sites with functioning ISMS have elements of EMS already in place
- Provides a unified strategy for the management of resources and the control and attenuation of risks
- Establishment and achievement of organizations ES&H goals



# Integration of EMS into ISMS and Sustainability



# Methods to Integrate EMS into ISMS

- Insert environmental hazard identification and analysis into safety analysis process and work package reviews or checklists
- Revise relevant safety procedures to include environmental issues
- Include EMS yearly management review into yearly ISMS management review
- DOE Guide 450.1-2 provides detailed guidance for integrating EMS into ISMS

# Parallels Between ISMS and EMS

- Discuss hand-out

# EMS Implementation Issues

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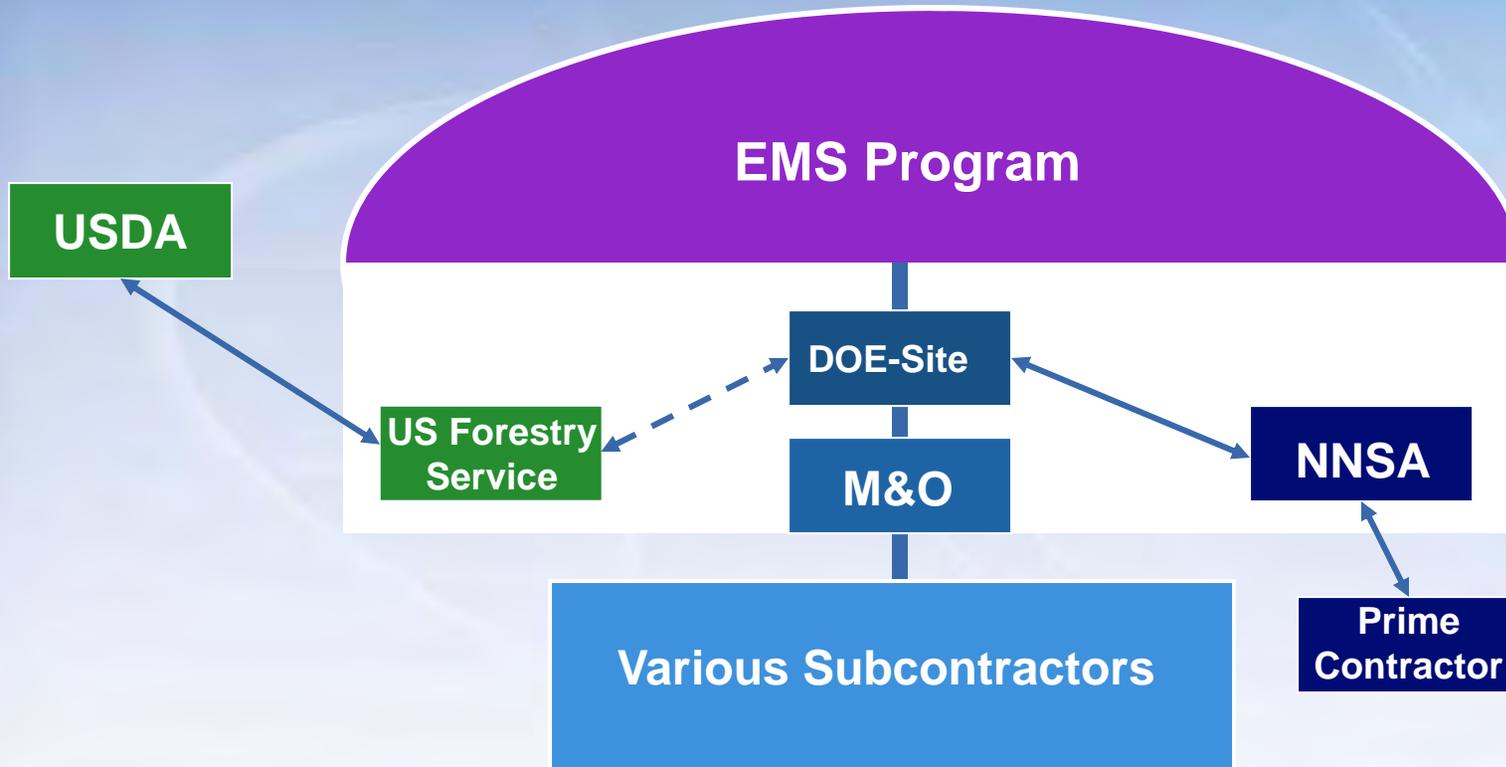
# Challenges in Federal Facility EMS Implementation

- Connection to mission
- Resources (\$) and management support
- Dealing with “political” issues
- Changing priorities
- Scale of the effort
- Multi-Tenant Facilities and contractors
- Verifying the systems
- Staff Turnover (frequent changes in leadership and their goals)
- Finding relevant metrics (administrative vs. environmental condition or cost; performance vs. conformance)
- Finding the best element to motivate employees

## EMS Challenges (as documented by the sites)

- Coordinated EMSs and EMS reporting for large DOE facilities where there are multiple DOE program offices, multiple contracts, multiple leases, and other Federal agencies
- Managing limited resources to achieve maximum benefits
- Sustained corporate knowledge with staff turnovers
- Maintaining visibility of EMS in light of increased emphasis on Conduct of Ops, ISMS, VPP, Documented Safety Analysis, Technical Safety Reviews
- Ensuring subcontractor performance of work in accordance with EMS
- Measuring sustainability successes in sites undergoing D&D where success is measured by schedules and waste generated and disposed
- Reducing energy and water within aging facilities

# EMS Challenge - Example EMS “UMBRELLA” for Sites with multiple prime contractors and multiple DOE Program Offices



# Performance Tracking and Reporting

- OMB's Environmental Stewardship Scorecard – scorecard used to track performance of federal agencies in achieving goals of EO 13423
- Pollution Prevention Tracking and Reporting System - DOE Sites and Program Offices use this system to report Site Profile, Recycling, Accomplishments and Awards, Waste Generation, and EPP data.
- Annual Sustainable Acquisition, Recycling, and Pollution Prevention Practices Report - summarizes DOE's purchases of EPP, greenhouse gas reduction benefits, and solid waste management and toxic chemical reduction practices (pollution prevention activities)
- Annual EMS Report to Office of the Federal Environmental Executive (OFEE) – summarizes progress of DOE in implementing EMS requirements of EO 13423

# OMBs Environmental Stewardship Scorecard

- **Green** – meets all Standards for success
- **Yellow** – Achieved intermediate levels of performance in all the criteria
- **Red** – has any one of a number of serious flaws



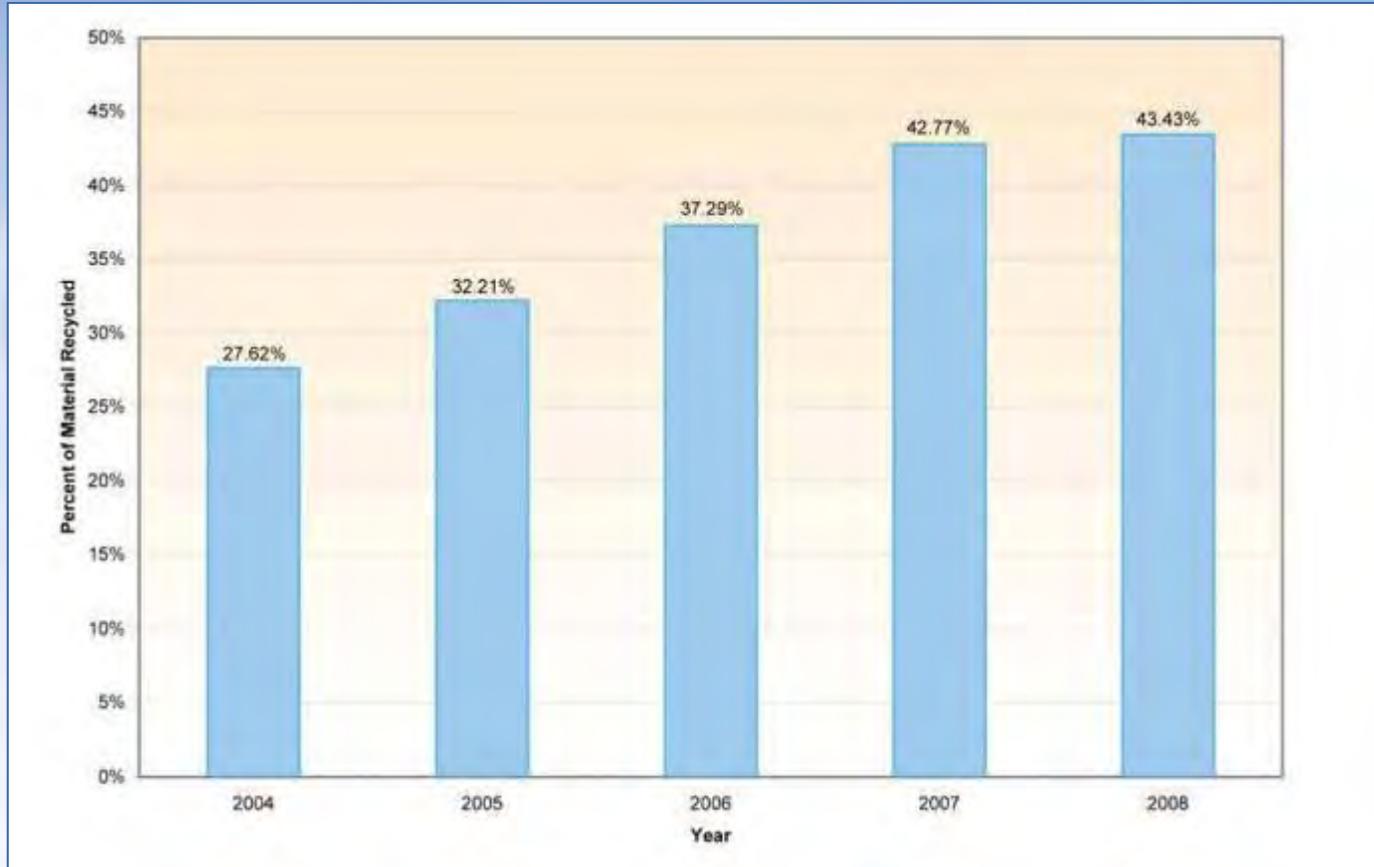
# Environmental Stewardship Scorecard

- DOE 1<sup>st</sup> Federal agency to score a **GREEN** in environmental stewardship
- DOE met or exceeded all of the FY 2009 “Criteria for Success”
  - EMS – 88% of DOE sites scored “green” on EMS implementation
  - Green Purchasing – DOE implements a robust green purchasing program (purchases of recycled-content material exceeded \$31.9 M and 26 sites purchased 18 types of renewable, non-haz biobased products)
  - Sustainable Design/Green Building – DOE has comprehensive program for high performance sustainable buildings in new construction and the retrofit of 15% of existing buildings by 2015

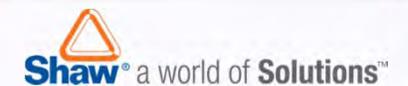
# Environmental Stewardship Scorecard

- Electronics Stewardship – Life-cycle energy savings exceeding 421,000,000 kilowatt hours
  - 96% computer purchases were EPP electronics (EPEAT)
  - 95% of DOE sites employ power management practices
  - 98% of surplus and end-of-life electronics were reused or recycled
- Solid Waste Diversion – 100% of DOE sites have active recycling programs resulting in 43% (102 MT) of solid waste recycled versus disposed
- Greenhouse Gas Reductions – Total carbon emission reductions are over 60,000 MT

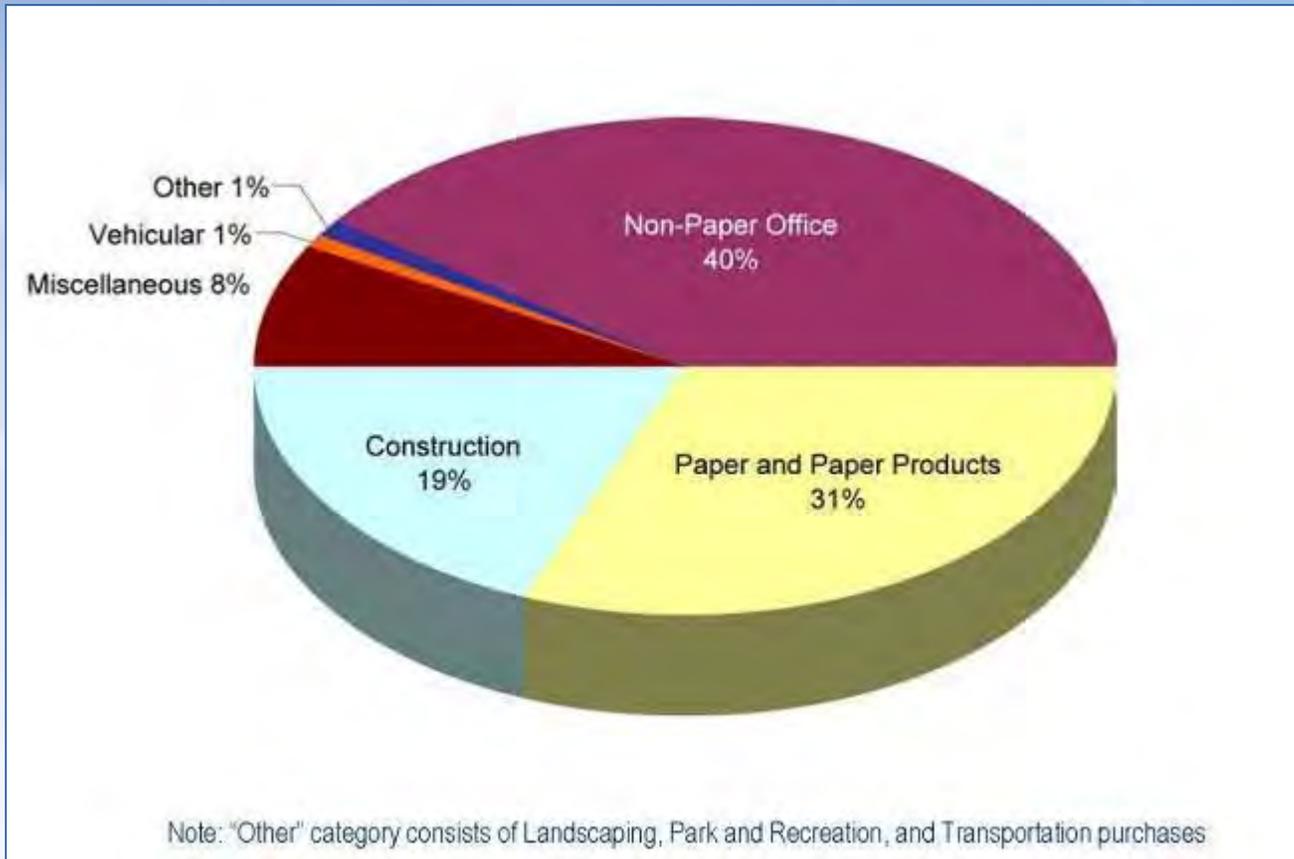
# DOE Recycling Data Trends (2004 – 2008)



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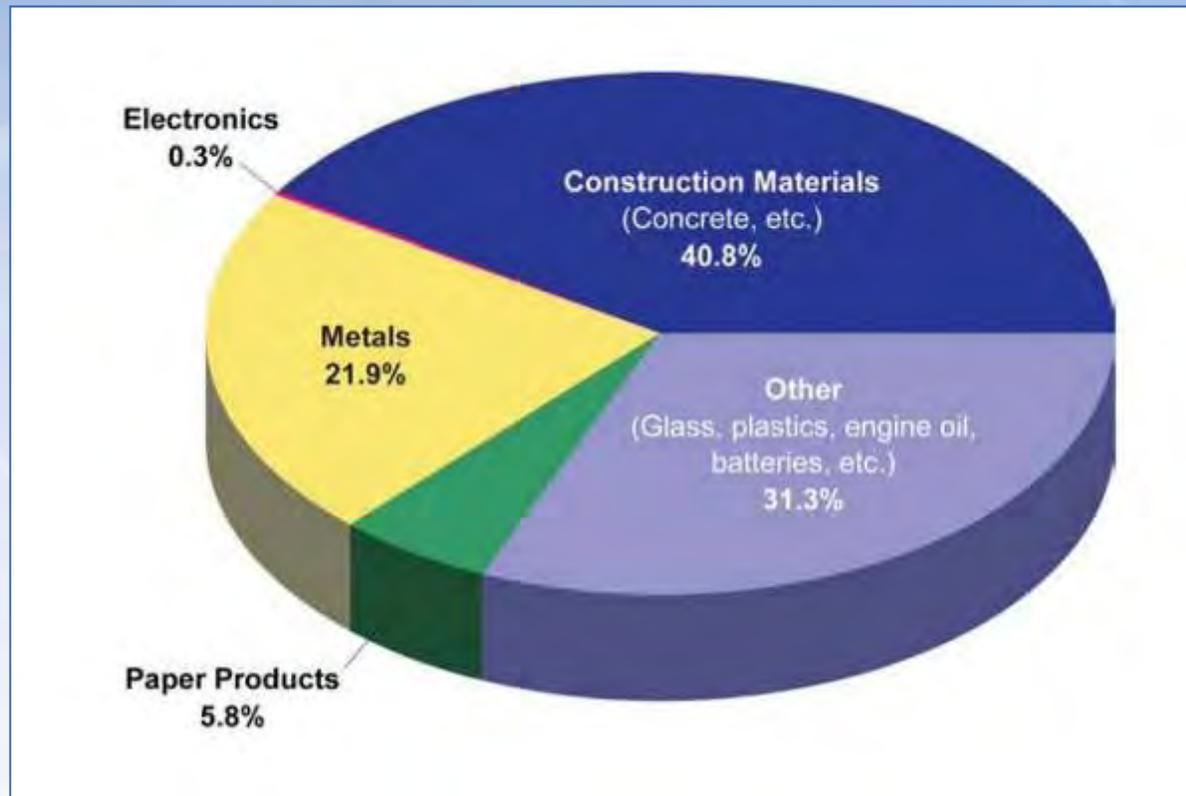
# Category Breakdown of Recycled Content Purchasing in DOE for 2008



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# Breakdown of Materials Recycled in DOE for 2008



# A Sampling of EMS Best Practices

- Using hazard analysis checklist to review planned work activities
- Changed compliance from media-based to activity-based
- Use a user-specific regulatory update notification system
- Initiated subcontractor awareness and oversight program
- Tie EMS targets directly to contract objectives
- Tie EMS goals to management performance
- Chartered a coordinated Environmental Protection Subcommittee/EMS Core Team
- Perform more self-assessments that lead to continual improvement
- Using software purchasing program to ensure effective green purchasing
- Instituted a spill control program for heavy equipment
- Joined the Climate Registry to calculate GHG data

# PORTS Clean Debris Removed from Two Old Warehouses Recycled for Fill



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# PORTS – Reuse of 15,000 MT of Uranium Hexafluoride – Valued at \$2B



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# Other Metrics to Measure EMS Benefits

- Complaints, communications
- Incidents, losses
- Time spent per task
- Dollars per unit activity
- Number of non-compliances, penalty costs

# American Recovery and Reinvestment Act (ARRA) Issues Related to Sustainability



# Acquisition Letter on “Safety Considerations under Awards using ARRA Funding”

- In Draft - Anticipates that all new projects have a Worker Safety and Health Program including the identification, assessment and mitigation of hazards...including environmental hazards



# Acquisition Letter on “Greening Considerations under Awards using ARRA Funding” – in Draft

- All contractors receiving ARRA funds must:
  - Ensure compliance with requirements to reduce energy and water consumption
  - Construct high performance and sustainable buildings
  - Procure environmentally preferable and energy efficient products
  - Reuse and recycle D&D materials
  - Reduce or eliminate the use of toxic chemicals and hazardous materials
- Compliance will be managed through EMS
- Contractors must flow down these requirements to subcontractors

# Integrating Sustainability into Clean-up, Stabilization and Decommissioning Activities

- How do I do that?
- I just want to generate waste!
- How do I stay on schedule if I have to do this?



# Just use Disposal Facilities!



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# We can just build more landfills!



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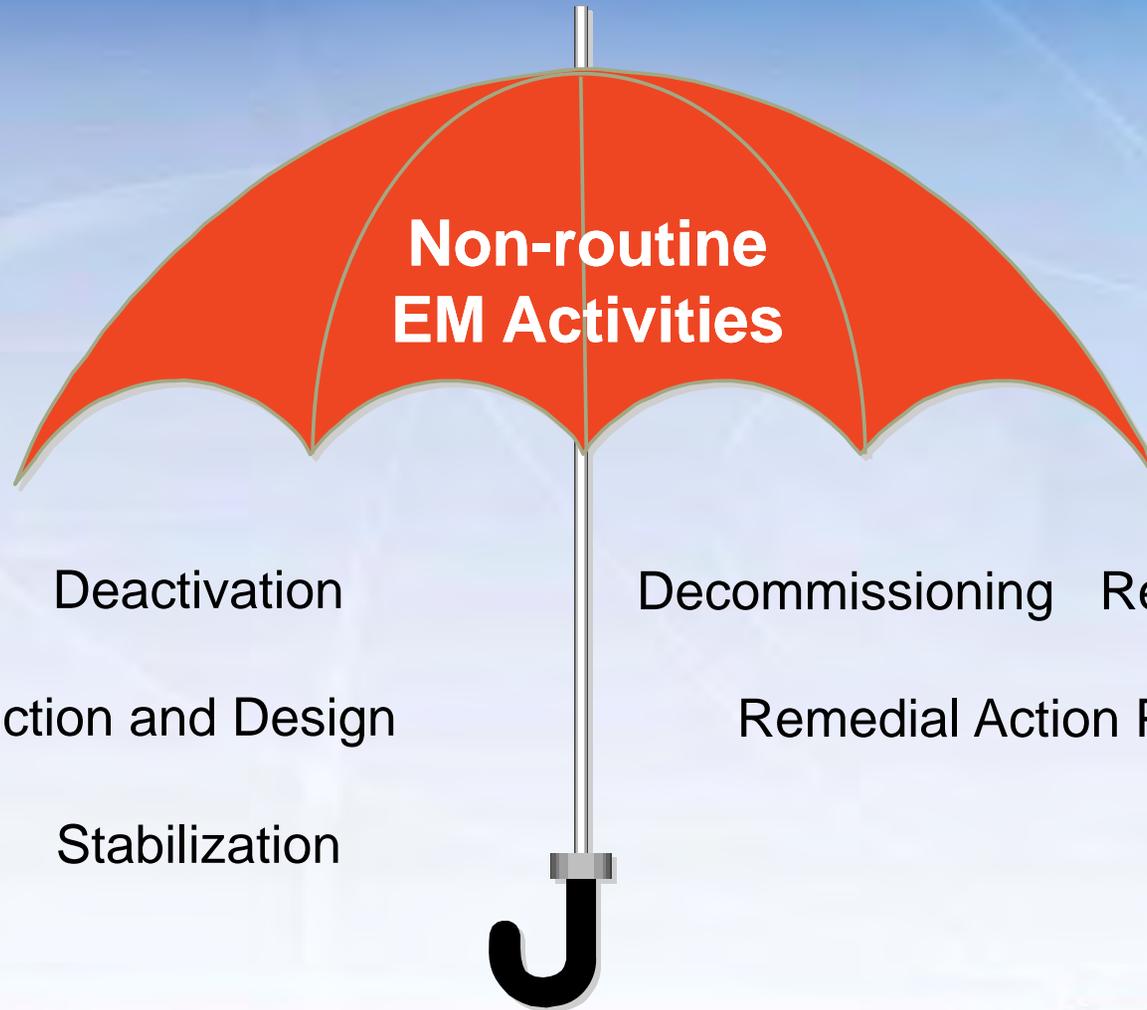
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# Barriers to Integration of Sustainability Principles into EM Activities

- Negatively impacts project cost and schedule
- Perception by public that materials released from DOE facilities are dangerous
- No unified regulatory requirements for radioactive solid waste
- Timely, cost-effective, and real-time characterization methods are not available or routinely used

# Scope of EM Activities

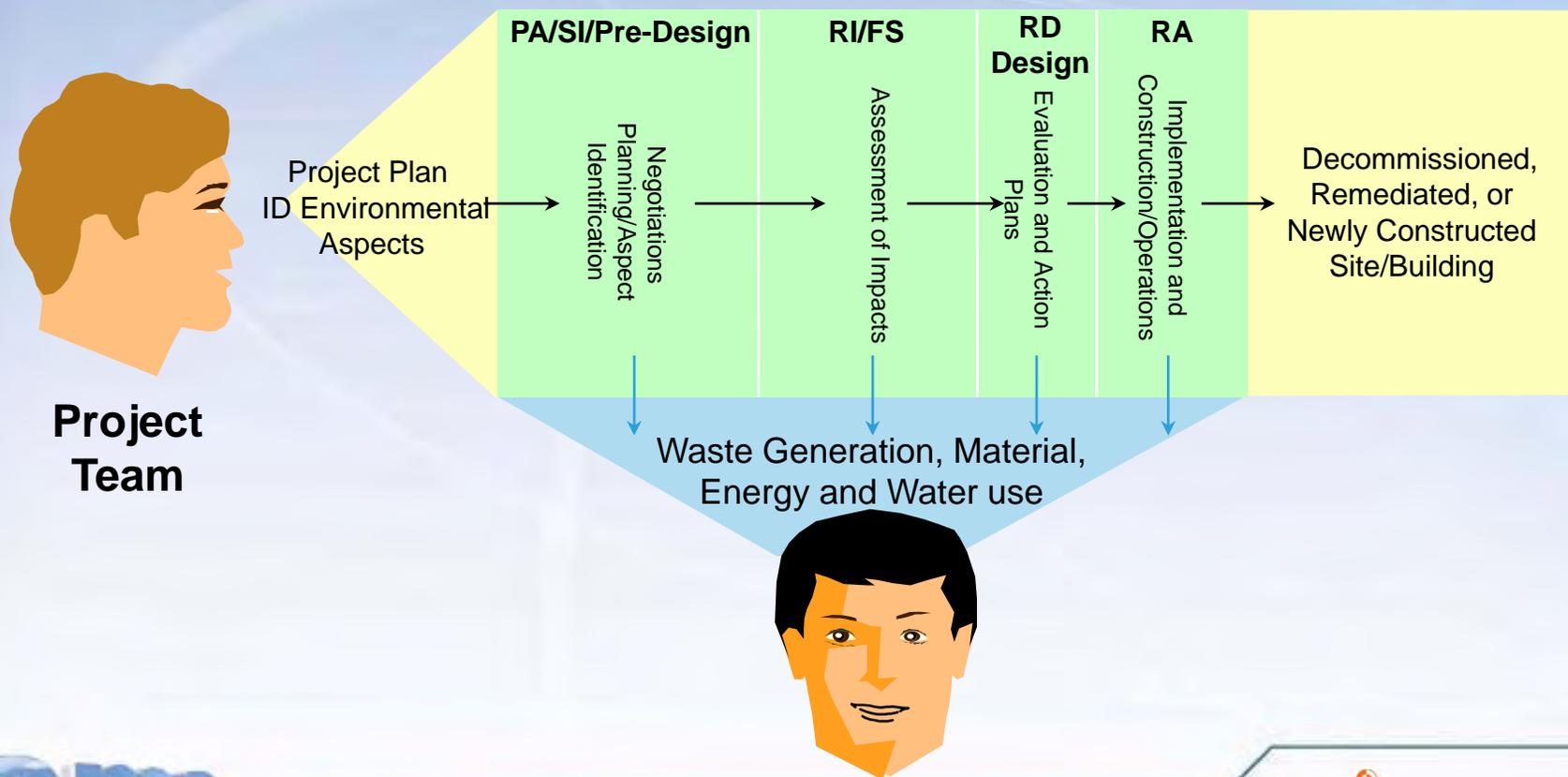


# Sustainability Approach for Non-Routine Activities



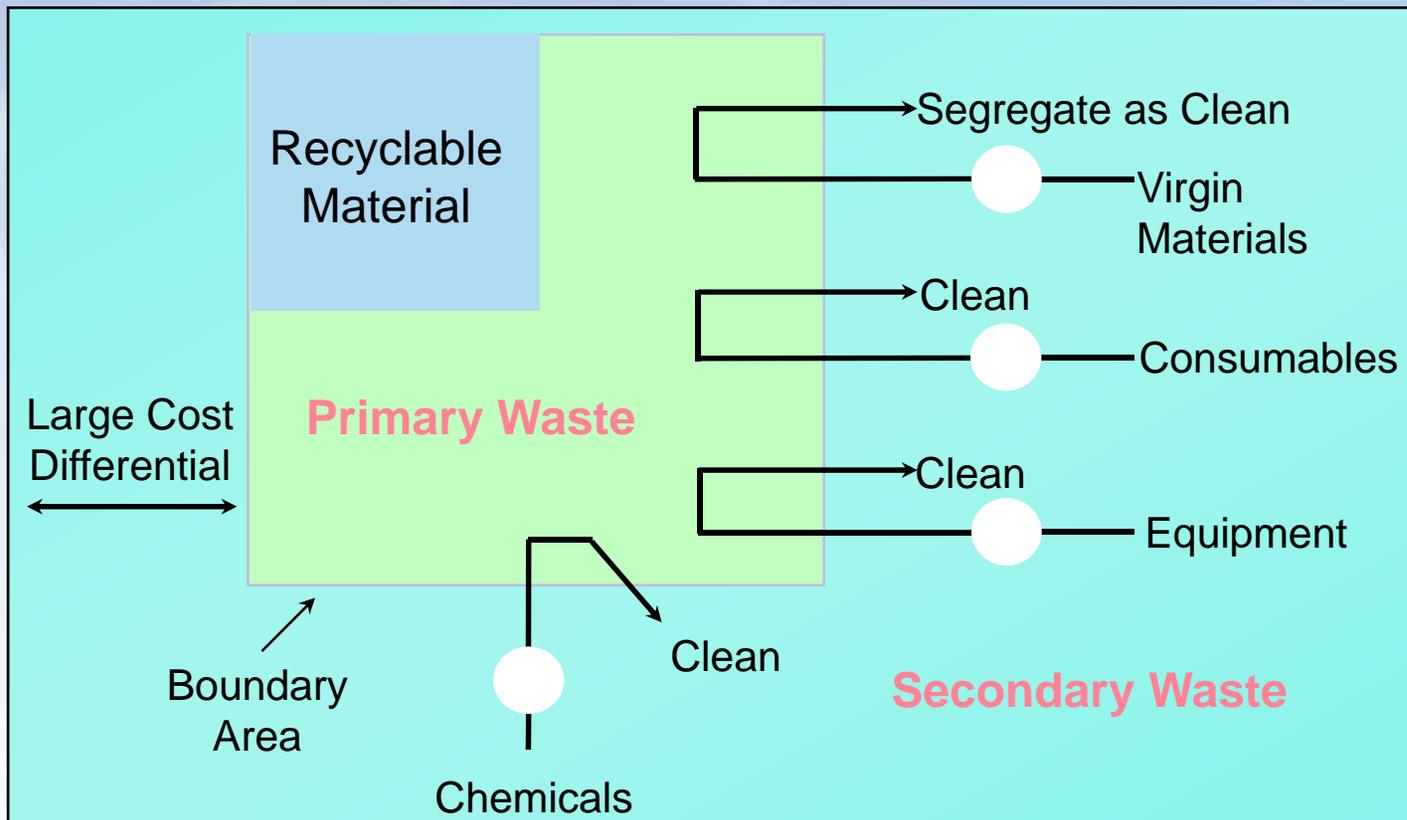
# Sustainability Logic for EM Activities

- Looking at the Life-cycle of an ER Project from the Aspect of the Waste and Energy/Water Use



# Sustainability Logic for Non-Routine, EM Projects

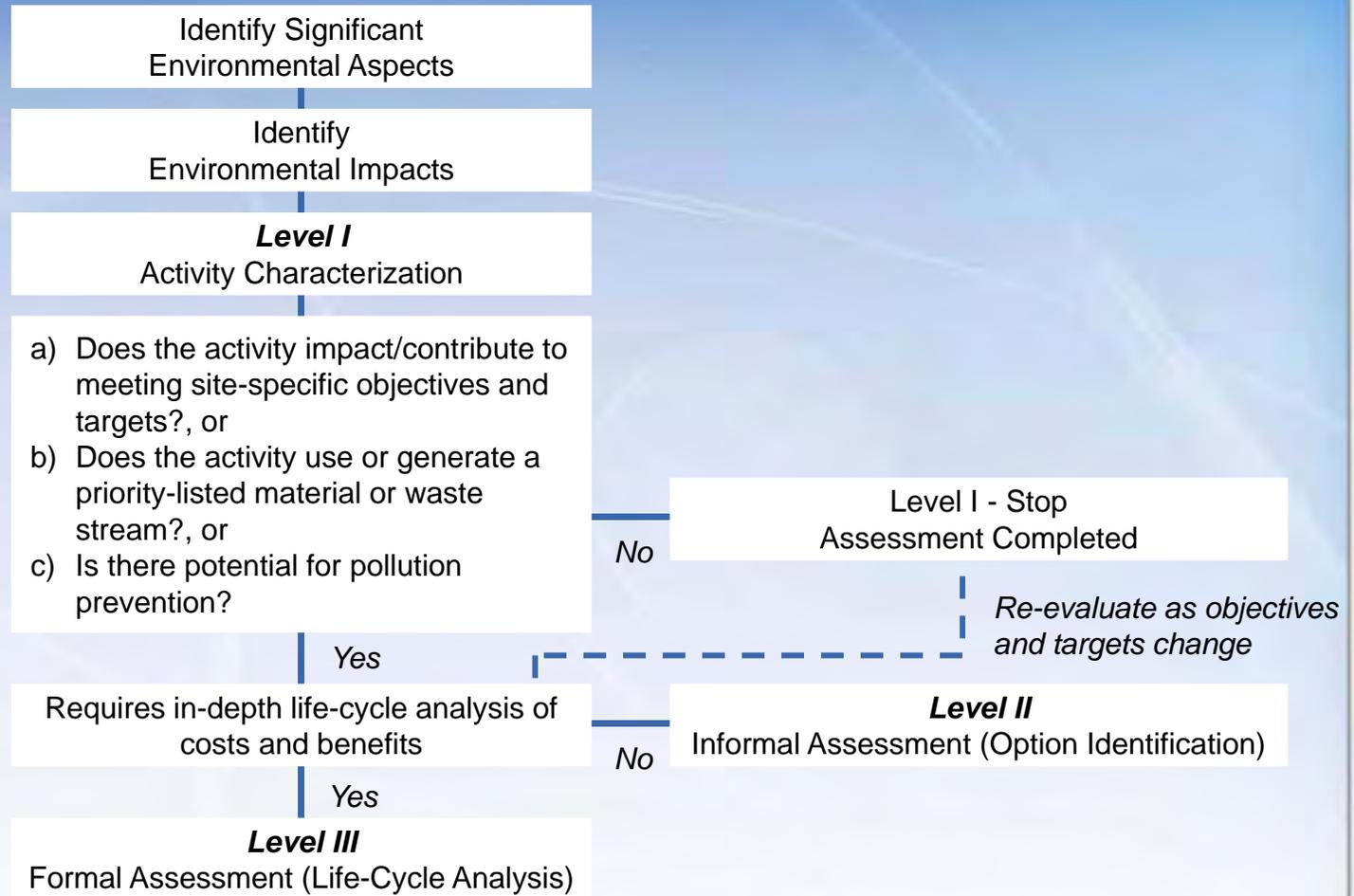
## Potential Waste for Disposal



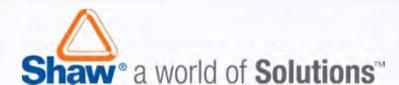
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# P2 Opportunity Assessment Approach Logic Diagram



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# Opportunities and Tools

- Deployment of proven technologies and techniques
- Effective EMS and waste minimization training
- Integration into upfront project planning
- Performance-based incentives into appropriate contracts to encourage reduced environmental impacts
- Increase the recycle/reuse of materials
- Appropriately represent waste disposal costs for equitable evaluation
- Incorporate sustainability into ROD and Post-ROD implementing documents

# Planning is Essential with D&D and ER Projects

- Evaluate project for environmental aspects and impacts
- Discuss and negotiate regulatory issues
- Forecast and characterize significant primary and secondary waste stream volumes, energy, material, and water use
- Determine waste disposition alternatives
- Assess sustainability opportunities for each significant, forecasted waste stream
- Perform sustainability assessments on repeated, general activities that occur from project to project - a series of routine activities
- Document sustainable activities/alternatives chosen for future comparison
- Document lessons learned from project to project

# How can you implement P2 in ER?

- Segregate “like” materials to avoid mixed waste
- Reuse PPE whenever possible
- Minimize material, equipment, and personnel in controlled areas
- Fill void spaces of containers with compactible material such as soil, PPE, insulation if allowed in waste acceptance criteria
- Reduce packaging inefficiencies by using appropriate containers
- Utilize volume reduction whenever feasible
- Scabble localized hot spots from concrete to enable reuse
- Mechanically remove localized contamination from equipment
- Specify non-hazardous decontamination solutions
- Use HEPA ventilated units and wetting agents to prevent spread of contamination



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# PORTS X-770 Mechanical Test Facility D&D



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# Hanford D&D Project



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# Glove Box Removal from Plutonium Finishing Plant – Size Reduction is key!



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# Demolition of 233 S - Plutonium Concentration Facility



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# Hanford Demolition Project



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# Cleverness and Ingenuity



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# Everything Costs Something!



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# Don't get 'bit' without an EMS!



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