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ISO 14001 Environmental Management System Training

Identifying Environmental Aspects & Impacts and Defining Significance

Iowa Department of Natural Resources

June 27, 2024

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This webinar is being recorded

Welcome and Introductions

- Name
- Where do you work?
  - Title/Department/Facility
- What is your experience with:
  - EMS?
  - ISO 14001?
  - Environmental Compliance?
  - Audits?
- What do you hope to get out of this training?

Workshop Agenda

- Overview of the ISO 14001 Standard
- Identifying Environmental Aspects & Impacts and Defining Significance
  - Determining aspects and impacts
  - Ensuring your rating system is appropriately highlighting the most significant objectives
  - “Workshop” Exercise
- Developing Objectives & Targets

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Overview of the ISO 14001 Standard

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What is an EMS?

Environmental Management System (EMS):

- Framework to proactively manage activities to:
  - Control and minimize impacts to the environment;
  - Comply with environmental laws, regulations, voluntary requirements;
  - Continually improve environmental performance.

- Can be certified to ISO 14001

- Even organizations which do not choose to certify typically follow the ISO 14001 model

What is ISO?

- International Organization for Standardization
- Founded 1946
- Representatives from 160+ countries
- American National Standards Institute (ANSI) – U.S. representative

ANSI
American National Standards Institute

ISO

ISO 14001 Standard

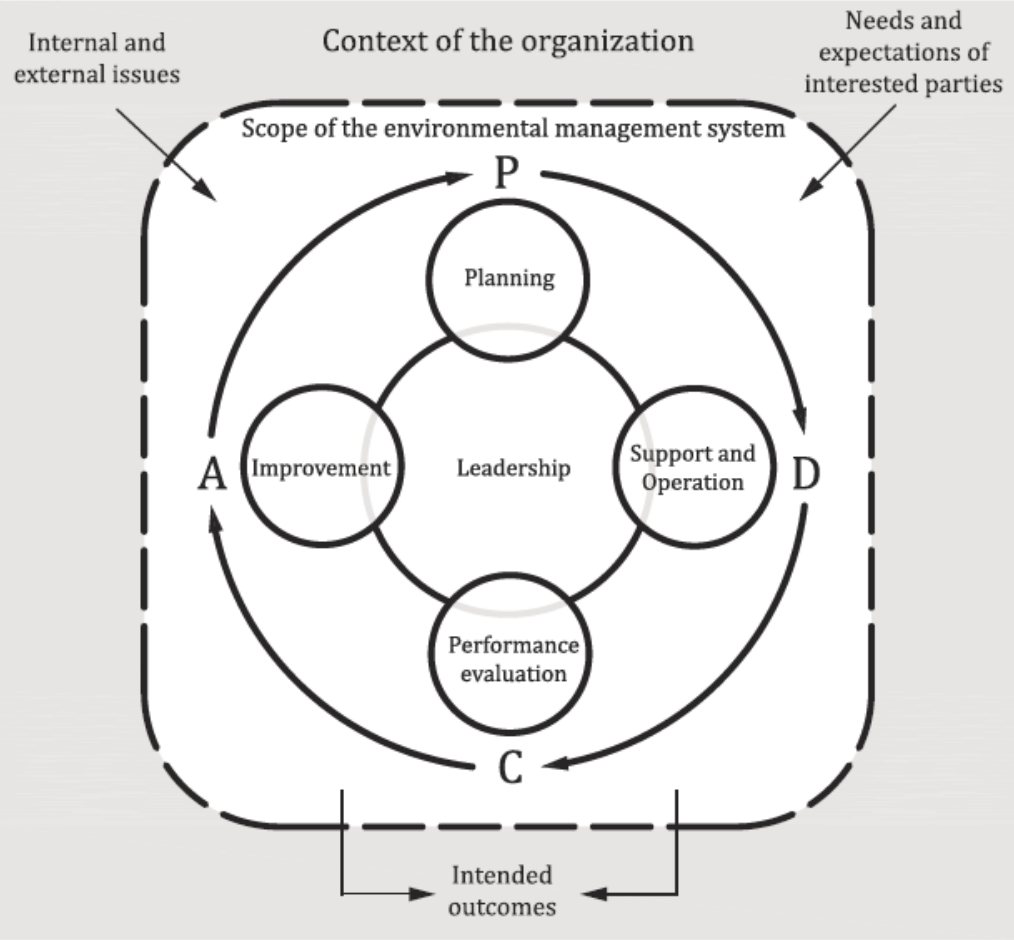
- THE international standard for EMS.
- Over 529,000 certificates issued in 181 countries.
- Top 3 countries: China, Japan, Italy.
- <1% ISO 14001 certificates in North America.
- Can certify individual site or multi-site.

ISO 14001 Certifications

- Individual site EMS
  - Organization of facility environmental management efforts
- Multi-Site EMS
  - Standardization across the multi-site organization
  - Elements of customization at each facility, but with multi-site oversite
  - Sharing of lessons learned
- Keys to Success:
  - Understanding standard and unique business processes, company culture, gaps/opportunities.
  - There is no one size fits all

ISO 14001: 2015 Framework

Cyclical continual improvement framework



Source: ISO 14001:2015(E)

PDCA:

- Plan
- Do
- Check
- Act

Overview

This is a *Process*, not a Performance Standard

First three clauses are generally administrative in nature:

- Clause 1 - *Scope*
- Clause 2 - *Normative References*
- Clause 3 - *Definitions*

Clauses 4-10 define the EMS requirements

4.0 Context of the Organization

External and internal issues that could impact your EMS:

- Environmental conditions (climate, water quality, land use, etc.)
- Cultural, social, political, regulatory, economic circumstance
- Internal characteristics or conditions of the organization
  - Activities, products, services
  - Strategic direction
  - Culture
  - Capabilities

5.0 Leadership

Entire clause dedicated to leadership roles and responsibilities.

- 5.1 Leadership and commitment
  - Specifies ways leadership is to demonstrate commitment to the EMS.
  - Top-down accountability for the effectiveness of the system.
  - Ensure integration of EMS into business processes.
  - Provide resources and support.
- 5.2 Environmental Policy
  - Commitments to
    - Protection of the environment
    - Compliance
    - Continual improvement
- 5.3 Organizational roles, responsibilities and authorities
  - “Management representative” no longer required, but the roles/responsibilities are still there.

6.0 Planning

- 6.1 Actions to address risks and opportunities
  - 6.1.1 General
  - 6.1.2 Environmental aspects & Assessment of risks and opportunities
  - 6.1.3 Compliance obligations / Legal and other requirements
  - 6.1.4 Planning Action

6.0 Planning

- Environmental Aspects
  - Consider a life-cycle perspective
  - Must consider abnormal conditions and emergency situations
  - Determine which aspects/impacts are significant (SEAs)
- Compliance obligations
  - Determine what the obligations are and how they apply to the organization
  - Maintain documented information of compliance obligations

Take actions to address SEAs, compliance obligations, risks/opportunities.

6.0 Planning

- 6.2 EHS Objectives and planning to achieve them
  - 6.2.1 Environmental Objectives
    - Consider risks & opportunities
    - Consistent with the policy
    - Must be measurable
    - Must monitor, communicate, update
  - 6.2.2 Planning actions to achieve objectives
    - Resources required, responsibilities, and what/how/when it will be done
    - Determine how results will be evaluated
    - Consider how to integrate objectives in the organization's business processes.

7.0 Support

- Resources
  - Determine and provide needed resources.
- Competence
  - Includes employees and those doing work under the organization's control
  - Ensure competence on basis of education, training, and/or experience
  - Identify training needs
  - Appropriate documentation must be kept as evidence of competence
- Awareness
  - Those doing work under the organization's control must be aware of:
    - Environmental policy
    - Significant environmental aspects/impacts associated with their work
    - Their contribution to the EMS, including the benefits of enhanced environmental performance
    - Implications of not conforming to EMS requirements, including compliance obligations

7.0 Support

- Communication
  - Have processes on what/when/with whom to communicate
  - Consider compliance obligations.
  - The organization must respond to relevant communications on its EMS and must keep records as evidence of its communications, as appropriate.
  - Internal:
    - Communicate information relevant to the EMS among various levels and functions, including changes.
    - Enable employees/contractors to contribute to continual improvement.
  - External:
    - Communicate information relevant to the EMS per communication processes and compliance obligations.
- Documented Information (Documents and records)
  - Ensure appropriate identification and description, format and media, and review for suitability and adequacy
  - The organization shall address:
    - Distribution, access, and retrieval
    - Storage and preservation (including legibility)
    - Shall have version control
    - And retention and disposition.

8.0 Operation

- 8.1 Operational planning and control
  - Controls can include engineering controls and procedures
  - Control planned changes and review/mitigate consequences of unintended changes
  - Ensure outsourced processes are controlled or influenced
  - Consistent with a life cycle perspective:
    - Ensure environmental requirements are addressed in design and development
    - Determine requirements for procurement
    - Communicate relevant requirements to external providers, including contractors
    - Consider need to provide info on potential impacts related to transportation, use, end-of-life treatment, and final disposal of products and services.

9.0 Performance Evaluation

- 9.1 Monitoring, measurement, analysis, and evaluation
  - 9.1.1 General
    - Monitor, measure, analyze, and evaluate environmental performance and effectiveness of EMS
    - Determine what/how/when monitored and evaluated
    - Ensure monitoring equipment is calibrated or verified
    - Communicate relevant environmental performance information (internally and externally) per processes and compliance obligations
    - Retain records as evidence of the results

10.0 Improvement

- 10.1 General
  - Determine opportunities for improvement and implement actions to achieve intended outcomes
- 10.2 Nonconformity and corrective action
  - When a nonconformity occurs:
    - React and take action to control and correct it
    - Deal with the consequences
    - Evaluate need for corrective action to eliminate the root cause to avoid recurrence
    - Implement corrective action
    - Review effectiveness of actions taken
    - Make changes to the EMS if necessary
    - Maintain records
- 10.3 Continual improvement
    - Continually improve the EMS to enhance environmental performance

Steps to Implementation

1. Determine our Goals for EMS
2. Conduct Gap Analysis
3. Determine the Scope and Context of the EMS
4. Obtain Commitment from Leadership
5. Build an Implementation Team
6. Set the Environmental Policy
7. Establish Documentation System
8. Identify Compliance Obligations

Steps to Implementation

9. Identify Risks, Opportunities, Aspects & Impacts
10. Establish Environmental Objectives
11. Develop Procedures & Operational Controls
12. Implement EMS Training
13. Conduct EMS Audits
14. Implement Corrective Actions
15. Complete Management Review
16. ISO 14001 Registration (optional)

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Identifying Environmental Aspects & Impacts and Defining Significance

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Identifying Aspects & Impacts

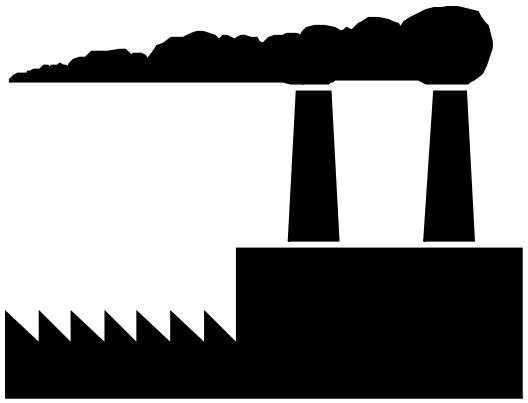
- Identify aspects associated with an organization's products, activities, and services, considering a life cycle perspective.
- Take into account changes, abnormal conditions, shut-down and start-up, and emergency situations
- Develop criteria of significance and identify significant environmental aspects (SEAs)
- Communicate SEAs in the organization
- Document aspects, impacts, criteria, SEAs

Significant aspects must be taken into account in establishing, implementing, and maintaining an EMS.

Environmental Aspect

Definition: ISO 14001:2015

Element of an organization's activities, products or services that interacts or that can interact with the environment.



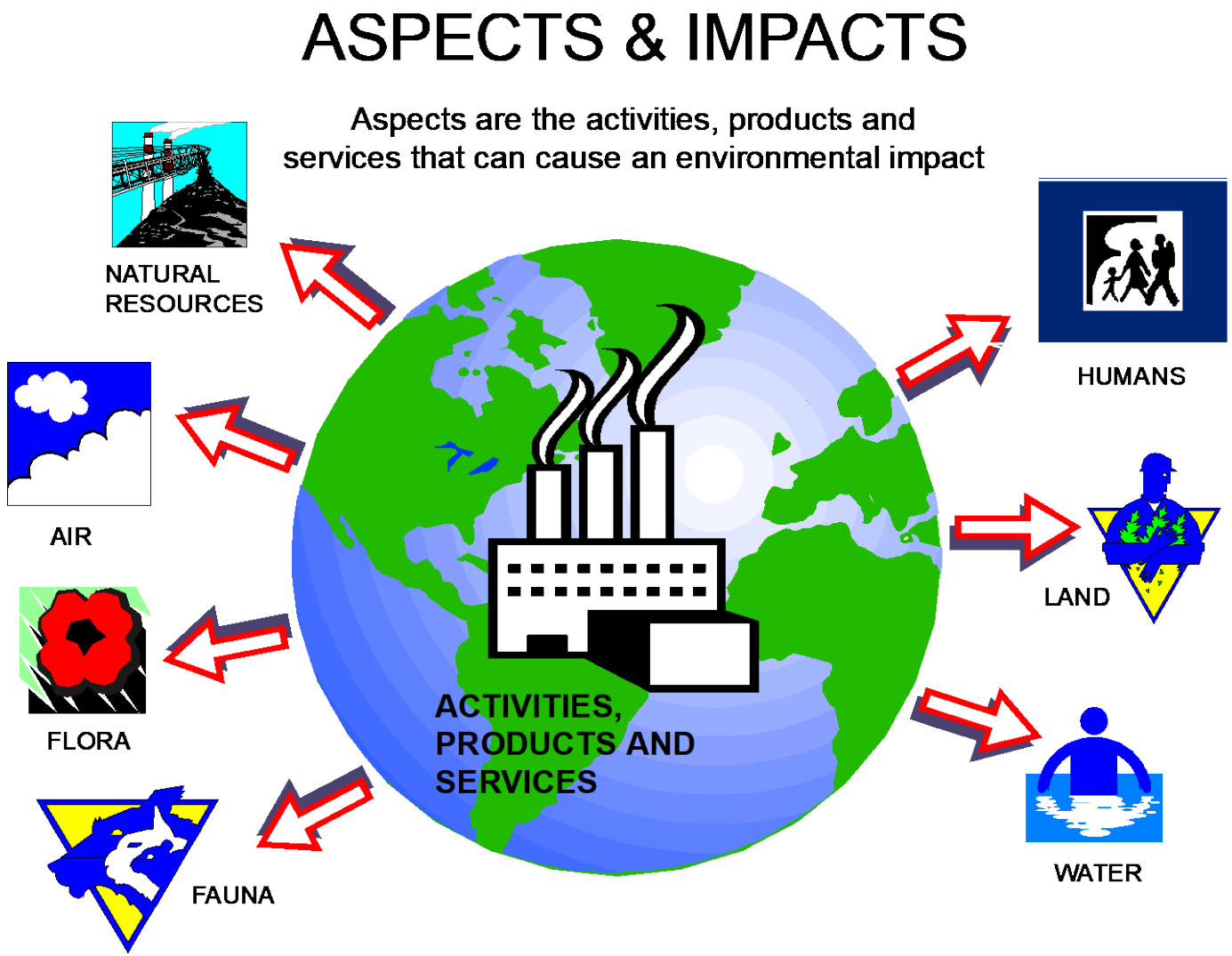
Environmental Impact

Definition: ISO 14001:2015

Change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects.

(The change to the environment as a result of the aspect)

Aspects and Impacts



Environmental Aspects

Getting started

- Examine the entire organization
  - By department, by product, by process
- Create list of aspects that affect the environment
  - Through flowcharting
  - Through brainstorming
  - Through evaluation of processes
  - Utilize employees

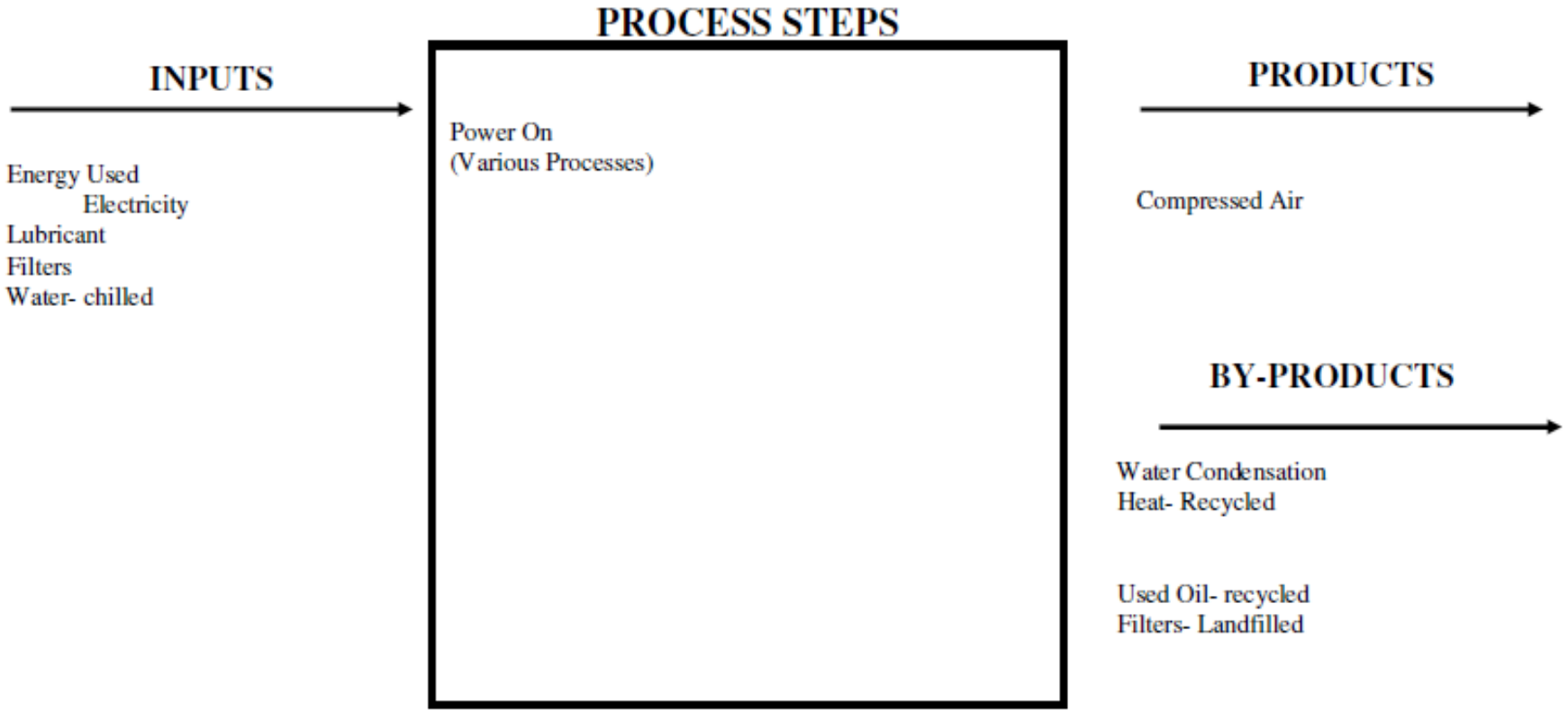
Examples of Aspects

- Energy usage
- Water consumption
- Raw material selection and usage
- Air emissions
- Wastewater
- Solid waste generation

- Aspects are the inputs and outputs of your activities and processes

Aspects: Inputs and Outputs

Major Activity / Operation: Air Compressors



Environmental Aspects

Environmental Aspects Analysis

Life Cycle Stage	Process / Activity	Aspect	Impact	Legal	Significant?
Wastewater Treatment Process			**Energy efficient product; minimizing site energy footprint.**		
Inputs					
Input	Process wastewater collected from various area of the facility.	Use of Energy	Electricity - indirect GHG generation and impact to facility energy footprint.	Yes	Yes
Input	Sanitary wastewater from various areas of the facility.	Use of Energy	Electricity - indirect GHG generation and impact to facility energy footprint.	Yes	Yes
Input	Bulk and mercantile chemical quantities brought on-site to be utilized for operations.	Chemical Transport, Storage, Spills	Spills to ground, stormwater, and or wastewater treatment	Yes	Yes
Input	Maintenance supplies brought on-site utilized for operational activities.	Use of Raw Materials	Transportation of materials - indirect GHGs (trucks, trains, etc.)	No	No

Environmental Aspects

Life Cycle Stage	Process / Activity	Aspect	Impact	Legal	Significant?
Outputs					
Output	Treated process wastewater effluent discharged from facility.	Releases to Municipal POTW	Loadings sent to process wastewater pre-treatment equipment requiring partial treatment prior to discharge to municipal POTW.	Yes	Yes
Output	Pre-treatment sludge liquids collected and disposed.	Transported and disposed at local anaerobic digester	Sludge disposed at 3rd party anaerobic digester system (Privately owned and operated).	Yes	Yes
Output	Treated sanitary wastewater effluent discharged from facility.	Releases to Municipal POTW	Treated wastewater sending loadings (COD, BOD, TSS, Phosphorous, etc.) to municipal Publicly Owned Treatment Works (POTW)	Yes	Yes
Output	Storm water management.	Releases to stormwater drains and water bodies.	Storm water and residual pollutants discharged to facility stormwater outfalls.	Yes	Yes
Output	Generation of general solid waste from operations.	Generation of Waste and/or By-Products	Materials disposed via landfill or recycled with contractors impacting waste mgmt footprint.	Yes	Yes
Output	Generation of hazardous / universal wastes from operations.	Generation of Waste and/or By-Products	Materials disposed via specialized hazardous waste contractors impacting waste mgmt footprint.	Yes	Yes
Output	Generation of mechanical / electrical wastes from operations.	Generation of Waste and/or By-Products	Materials disposed via landfill or recycled with contractors impacting waste mgmt footprint.	Yes	Yes

Environmental Impacts

- Identify environmental impacts associated with the previously determined aspects
- Undertake “scoring” for each
- Allocate significance - threshold/ cut-off point
- Produce register of environmental aspects and significant environmental aspects (SEAs)

Example Impact Categories

- Impacts to:
  - Air Quality
  - Land Quality
  - Water Quality
  - Natural Resources
  - Human Health

Significance Scoring

- Choose a significance scoring system to apply to aspects
- Choose categories/scale for scoring
  - Frequency
  - Compliance/regulatory
  - Severity
  - Business Interruption
  - Public Relation Involvement
  - Resources
- Choose formula for calculating significance

This is not a one-size-fits-all system. Develop scoring relevant to your organization.

Significance Scoring Example

- Impact scored from 1 (least) to 5 (highest) for each criterion
- Criteria categories
  - Frequency (F)
  - Severity (S)
  - Regulatory (R)
  - Community Concern (C)
- Overall significance score (SS) is product of individual criterion scores
  - F x S x R x C = SS
  - Determine what total number = “Significant”

Significance Scoring Example

- Criteria categories
  - Frequency (F)
    - 1 = never, 2 = infrequent, 3 = occasionally, 4 = often, 5 = constant
  - Severity (S) (cost)
    - 1 = no cost, 2 = $$, 3 = $$$, 4 = $$$$, 5 = $$$$$
  - Regulatory (R)
    - 1 = not regulated, 5 = regulated
  - Community Concern (C)
    - 1 = no impact, 2 = slight disturbance, 3 = public aware and impacted, 4 = harmful effect to public, 5 = threat to human life

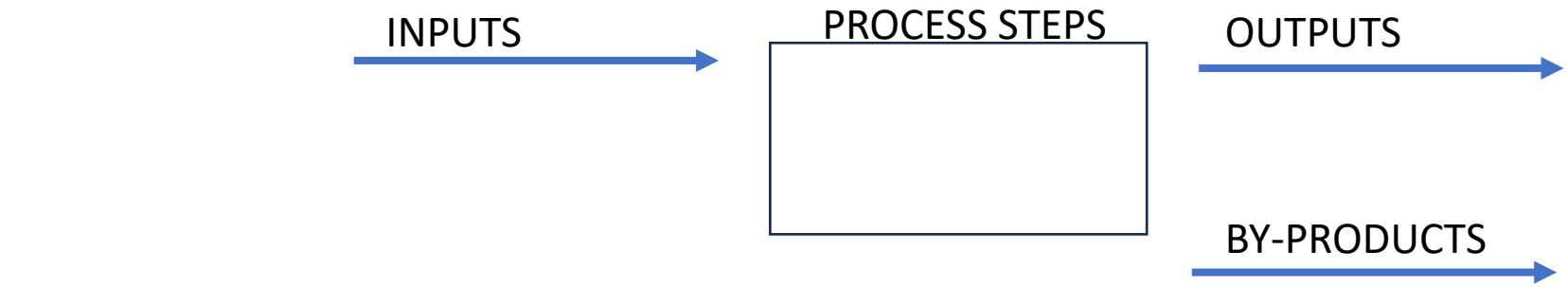
Tips

- Identify aspects for each major process/activity
- Combine similar or like processes into one category, if the aspects are the same
- Identify aspects under normal, abnormal, and emergency conditions
- When in doubt, K.I.S.S.

Environmental Aspects Workshop

- Choose an example activity/operation.
- List the environmental aspects (by input and output).

ACTIVITY: _____



- Identify the associated environmental impacts.

Activity	Aspect	Impact

Environmental Aspects Workshop

- Rank the aspects for significance using the criteria provided.
- Determine what constitutes “significant” for your organization.

Environmental Aspects/Impacts Scoring Criteria

	Frequency of Occurrence (F)	Severity of Occurrence (S)	Compliance Obligations (C)
High 3	Daily/Weekly	Will cause significant damage and sustained impact	Regulated activity - Environmental federal, state or local rules and regulations apply
Medium 2	Less than weekly but more than annually	Significant but not sustained, affects localized, non-sensitive area	Aspect potentially regulated if used a different way or if in greater quantities
Low 1	Less than once per year	Localized and minor	Best Management Practice

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Establishing Environmental Objectives

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Environmental Objectives

- Take into account the significant environmental aspects, compliance obligations, and risks and opportunities.
- Objectives shall be:
  - Consistent with the Environmental Policy
  - Measurable and Monitored
  - Communicated to the organization
  - Documented and kept up-to-date
- Objectives can be called Targets, Goals, any buzz word you like! As long as they utilize the SEAs to drive that improvement.

Environmental Objectives

- Objectives should be approved by top management.
- Objectives and action plans should be documented and communicated.
- Performance against objectives should be reported regularly.
- Objective goals can be adjusted, as needed, with changing circumstances, but MUST document why.
- Objectives should be SMART.

SMART Objectives

- ***Specific:*** What exactly are we trying to achieve?
  - Some questions to ask when determining objectives are WHY is this important, WHERE the improvement takes place, WHAT are the conditions and limitations involved?
- ***Measurable:*** Define the physical manifestation of the objective; define concrete evidence. Determine what will be tracked and how often to measure progress.
  - What are the metrics that can demonstrate effectiveness?
- ***Attainable:*** Don't over commit. Set a target that is reasonable and attainable.
  - Also consider available resources, time, and costs associated with attaining the objective.
- ***Relevant:*** Why does this matter?
  - Develop objectives that are relevant to your organization and mean something to your team and location. Engage employees where possible.
- ***Timely:*** Set a defined timeline that is realistic.
  - Can be for a year or can be for a longer period of time

Planning to Achieve Objectives

- What will be done? ACTIONS!
- What resources will be required?
- Who will be responsible?
- When will it be completed?
- How will the results be evaluated?

Environmental Objective Form Example

Environmental Objective #1 - Landfill Waste Reduction

The objective is to reduce solid waste to landfill by 10%:
Baseline: Fiscal Year 2021 – 70% of waste to landfill

This objective will be completed by this date:
End of Fiscal Year 2022 – 7/1/2022

Planning Actions to Achieve Environmental Objectives

	What	Resources	Who	When		Results		
Action Number	***Description of Activity***	***Description of Resources Required -- Financial, Capital, Personnel, Time, etc.***	***Responsible Party***	***Date Initiated***	***Expected Completion Date***	***Method to Evaluate Effectiveness of Actions***	***Status of Completion***	***Comments on Progress***
1	Implement cross department waste management team	Plant leadership buy-in, Environmental Supervisor, Maintenance Supervisor	Sally Soapbox	6/1/2021	8/1/2021	Gather information for last years waste total (tons), evaluate current waste generation and management practices		First meeting scheduled for August 2021
2	Select recycling vendor	Environmental Supervisor, Maintenance Supervisor	Joe Schmoe	6/1/2021	8/1/2021	Vendor is selected that is under budget, containers in place by completion date		Reviewing 3 local vendors – Waste Management, Recycle Plus, GreenLeaf, etc.
3	Implement office paper and cardboard recycling program	Environmental Supervisor, Maintenance Supervisor	Joe Schmoe Bob Lablaw	8/1/2021	7/1/2022	Acquire weight report from recycling company monthly to track progress.		Discussions for next Plant Operations Staff Meeting in Sept. 2018; on Agenda – Joe to speak on details.
4	Implement plastics recycling program throughout plant	Environmental Supervisor, Maintenance Supervisor	Joe Schmoe Bob Lablaw	8/1/2021	7/1/2022	Acquire weight report from recycling company thly to track progress.		Facility working with Regional Packaging Team to better understand materials used and supplied from vendor.

- Also list, what will be the method to track achievement of the objective?

"Monthly weight reports from paper and plastic recycling companies and waste company shall be gathered."

Environmental Objective Workshop

- Thinking back to the SEAs you developed in the first exercise, lets establish an Objective.
- What ACTION can drive improvement?
- What resources will be required?
- Who will be responsible?
- When will it be completed? Is this an achievable timeframe?
- How will the results be evaluated/measured/monitored?

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Questions??

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