

A Practical Approach to Environmental Aspect / Impact Review

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Key Words: ISO 14001 , environmental management system, Environmental Aspect, significant environmental impacts

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Abstract

One of the most difficult and misunderstood elements in the ISO 14001 EMS standards is 4.3.1 Environmental Aspects. Environmental Aspect review is critical for an organization to concentrate on significant environmental issues when setting environmental objectives and targets. This session will present an example of a relatively easy and proven procedure to identify and evaluate the significance of environmental aspects/impacts to meet ISO 14001 EMS requirements or improve an EMS. A software tool will also be demonstrated, which applies an Excel spreadsheet to simplify and provide consistency for the technique.

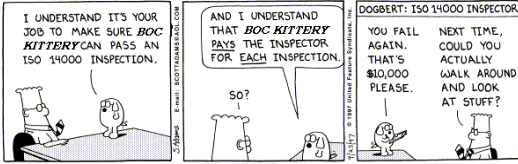
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A Practical Approach to Environmental Aspect Review

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A Practical Approach to Environmental Aspect Review

• Overview

- General recommendations for getting started
- ISO 14001 requirement
- Environmental Aspect & Impacts Definition
- Identifying Environmental Aspects/Impacts
- Determining Significance of Environmental Impacts

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General Recommendations for Getting Started on ISO 14001

- Get Corporate/Plant Buy-In
- Establish Site "Pollution Prevention Team" (include Operations & Maintenance personnel)
- Review ISO 14001 Requirements
- Establish "covered activities"
- Provide Adequate Resources

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General Recommendations for Getting Started on ISO 14001

- Conduct Gap Analysis & Prepare Action Plan
- Look at environmental & other Management Systems (ISO 9000, Safety, Maintenance Programs, Communications, HR) for potential integration
- Provide introductory training & publicize efforts throughout site & community (as appropriate)
- Don't over-commit with your policy or do too much too early

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Environmental Aspects Review

ISO 14001 Requirement

- 4.3.1-The organization shall establish and maintain (a) procedure(s):
 - to identify the environmental aspects of its activities, products or services (which it can control or have an influence)
 - determine those which have or can have significant impacts on the environment
 - ensure that the aspects related to these significant impacts are considered in setting its environmental objectives

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What is an Environmental Aspect?

- **Environmental Aspect Definition**
 - "An element of an organization's (e.g. facility's) activities, products or services that can interact with the environment"
- **Environmental Impact Definition**
 - "Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services"

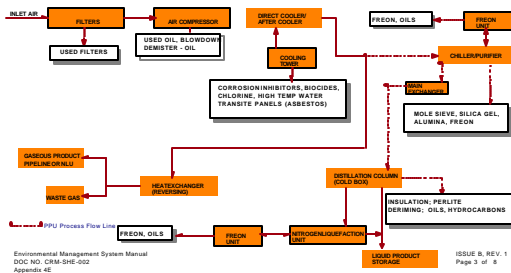
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Identifying Environmental Aspects

- Review Process Flow Diagrams
- Review Waste and “Non-product” release Information
- Review Permits and Regulatory Submissions
- Review Site Specific Work Tasks and Issues
- Review EISs if available
- Include “non-routine” activities
- Brainstorm
- Develop Comprehensive List of Environmental Aspects

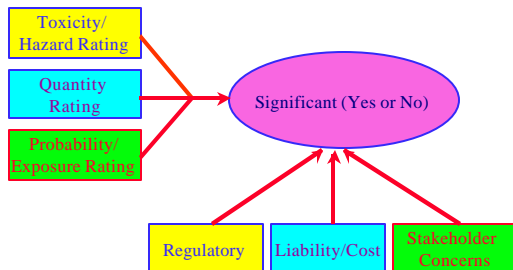
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AIR SEPARATION UNIT WASTE FLOW DIAGRAM



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Determining the Significance of Environmental Aspects/Impacts



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Criteria for Evaluating Environmental Impact Significance

Toxicity/hazard - The relative toxicity of the environmental aspect or the relative impact (e.g. ozone depletion) it may have on the environment/community.

Rating =

- 1 - Minor
- 2 - Moderate
- 3 - Major

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Criteria for Evaluating Environmental Impact Significance

Quantity - Generally the amount of the environmental aspect produced/used in a year (Use hazardous waste manifests, waste bills of lading, Form R's, fuel usage records, purchasing records, flow records, etc. for these estimates.

Rating =

- 1 - Minor
- 2 - Moderate
- 3 - Major

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Criteria for Evaluating Environmental Impact Significance

Probability/exposure - The likelihood of the environmental aspect/impact causing an exposure with significant environmental damage.

Rating

- 1-Minor
- 2-Moderate
- 3-Major

Multiply 3 Ratings (Toxicity X Quantity X Probability)

*****Score above 7 means the impact is significant!**

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Criteria for Evaluating Environmental Impact Significance

Regulatory - The environmental aspect/impact is regulated under a Federal, State, or local environmental requirement.

Rating
I=Insignificant
S=Significant

** An S in any column means the impact is significant!

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Criteria for Evaluating Environmental Impact Significance

Liability/Cost - The potential estimated liability or costs for taking corrective actions if the environmental aspect/impact is not managed properly.

Rating
I = Insignificant
S = Significant

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Criteria for Evaluating Environmental Impact Significance

Stakeholder Concerns - Identifies whether the environmental aspect/impact has been a legitimate concern of any stakeholder.

Rating
I=Insignificant
S=Significant

(See attached example of Environmental Aspect Rating Process)

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More Information?

- Marilyn R. Block. 1999. Identifying Environmental Aspects and Impacts. ASQ Quality Press. Milwaukee, Wisconsin 1-800-248-1946

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Environmental Aspect Review Procedure

A. Identification of Environmental Aspects

The methodology used to identify environmental aspects at this facility is provided below:

Step 1. A Site Team should conduct a detailed review of the site activities using Process Flow Diagrams, Waste Flow Diagrams, Good Environmental Management Practice Tables, etc. (See IMS 2205, Environmental Risk Control Strategies and Good Operating Practices) to identify applicable environmental aspects for the facility. To identify environmental aspects, it is often useful to review each process / activity individually and identify associated wastestreams and noise produced, as well as resources used. This can involve a review of production, maintenance, utilities (sewer, water, HVAC), office activities, non-routine activities, etc.

Step 2. Site-specific environmental aspects (both direct and indirect) related to site equipment and features (including waste and wastewater disposal facilities), neighbors, surrounding land use, environmentally sensitive areas, ecologically significant resources (e.g. surface and groundwater water sources, parks and recreation facilities, fishing areas, bird sanctuaries, wetlands, endangered species) and abnormal/emergency conditions should also be identified, ideally in a brainstorming session. (Note: It is valuable to engage everyone on-site in this process).

Step 3. Environmental Aspects and potential environmental impacts should be listed (See Environmental Aspect Review Spreadsheet). Examples of some typical Environmental Aspects are listed below:

Environmental Aspect	Potential Env. Impact
<i>Water Cooling System</i>	
• Cooling Tower Blowdown	- Pollution of Surface Water
• Cooling Tower Water Use	- Water Availability/Indirect Impacts
• Cooling Tower Water Treatment Chemicals	- Stormwater/soil/ surface water contaminant
• Cooling Tower Drift	- Aesthetic/Water Deposition
• Cooling Tower Noise	- Noise impacts to Neighbors/Biota
• Intake Screens	- Solid Waste Disposal
• Cooling Tower Pump Oil Leaks	- Oil contamination of Surface Water
<i>ASU Compressors</i>	
<i>Maintenance</i>	
<i>Industrial / Solid/Hazardous Wastes & Industrial / Solid/Hazardous Wastes</i>	
<i>Stormwater</i>	
<i>Domestic Wastes</i>	
<i>Storage</i>	
<i>Energy Production/Use</i>	
<i>Transportation</i>	
<i>Non-Routine Activities</i>	

Step 4. Review / update the identified Environmental Aspects at least annually or whenever there is a change in facility processes, surroundings, or laws and regulations (See Management of Change Procedure).

B. Evaluation of the Significance of Identified Environmental Aspects

A methodology that can be used to evaluate the significance of the identified Environmental Aspects is provided below:

Step 1. The Site Team should review the following factors to evaluate the significance of the Environmental Aspects. They include:

A. Toxicity/hazard - The relative toxicity of the environmental aspect or the relative impact (e.g. ozone depletion) it may have on the environment/ community.

B. Quantity - Generally the amount of the environmental aspect (e.g. waste quantity, kilowatt hours, etc.) produced/used in year. When the environmental aspect is measured in other terms (e.g. noise-decibels) the evaluation should be based on site-specific criteria. Hazardous waste manifests, waste bills of lading, waste transfer notes, permits/licenses, fuel usage records, purchasing records, flow records, etc. are used to estimate these quantities.

C. Probability/exposure - The likelihood of the environmental aspect causing an exposure with significant environmental damage.

D. Regulatory-The environmental aspect is regulated under a Federal, State, or local environmental requirement.

E. Liability/Cost - The potential estimated liability or costs for taking corrective actions if the environmental aspect is not managed properly.

F. Stakeholder Concerns- Identifies whether the environmental aspect has been a legitimate concern of any stakeholder.

Step 2. Each factor is evaluated by the Site Team using the criteria below to determine the significance of each Environmental Aspect and record the results on the Aspect Spreadsheet. A consensus can be obtained informally or can be accomplished through more formal (e.g. nominal group) techniques. As appropriate, the Business Unit Environmental Coordinator may facilitate this evaluation.

Step 3. When the score for **(A. Toxicity) x (B. Quantity) x (C . Probability / Exposure) = greater than 7**, the environmental aspect and associated potential environmental impacts are considered to be significant. Otherwise, if any other column is identified as significant, the environmental aspect and associated impacts are deemed significant.

C. Criteria for Evaluating Environmental Aspect Significance

Environmental Aspect Significance Criteria

A. Toxicity/Hazard

1 = Environmental Aspect involves primarily municipal (garbage) and relatively inert industrial waste, non-contact cooling water, components of air and inert compounds. Sound levels generated by activity at property line are less than **50** decibels.

2 = Environmental Aspect involves special wastes such as petroleum product wastes, criteria pollutants (products of combustion, etc.), and conventional water pollutants (BOD, COD, suspended solids, oil and grease). Sound levels generated by activity at property line are greater than **50** but less than **65** decibels.

3 = Environmental Aspect involves regulated toxic air pollutants, water pollutants, toxic chemicals, hazardous waste, PCBs, asbestos, ozone depleting or global warming substances, or other wastes/chemicals generally acknowledged to be toxic/hazardous to the environment. Sound levels generated by activity at property line are greater than **65** decibels.

B. Quantity

1 = Environmental Aspect involves less than 500 kilograms/year. Noise source(s) generates sound levels less than **50** decibels at property line.

2 = Environmental Aspect involves greater than 500 kilograms but less than 5,000 kilograms per year. Noise source(s) generates sound levels greater than **50** decibels but less than **65** decibels at property line.

3 = Environmental Aspect involves greater than 5,000 kilograms per year. Noise source(s) generates sound levels greater than **65** decibels at property line.

C. Probability/Exposure

1 = There is a low likelihood (0-10%) that the activity/aspect will result in an exposure over a 10 year period that causes significant environmental damage or complaints.

2 = There is a moderate (11-30%) likelihood that the activity/aspect will result in an exposure over a 10 year period that causes significant environmental damage or complaints.

3 = There is a high (> 30%) likelihood that the activity/aspect will result in an exposure over a 10 year period that causes significant environmental damage or complaints.

D. Regulatory

- Insignificant = Activity / aspect not regulated at Federal, State, or Local Level.
- Significant = Activity/aspect regulated at Federal, State, or Local Level.

E. Potential Liability/Cost Impact

- Insignificant = Cost liabilities associated with potential environmental impacts from the activity/aspect are estimated to be less than \$5,000.
- Significant = Cost liabilities associated with potential environmental impacts from the activity/aspect are estimated to be greater than \$5,000.

F. Stakeholder (interested party) Input

- Insignificant = No legitimate concerns identified by stakeholders related to environmental aspect.
- Significant = Legitimate concerns identified by stakeholders related to environmental aspect.

Below is an example of a rating of one selected Environmental Aspect

Environmental Aspect

Water Cooling System

	Toxicity / Hazard (1)	Quantity (2)	Probability / Exposure (3)	Significance Points³ (1x2x3)	Regulatory Compliance S/ I	Stakeholder Interest S/I	Cost / Liability S/I	Significant Aspect/Impact YES/NO
• Cooling Tower Blowdown	1	3	1	3	S	S	S	Y