
ISO 14001 4.3.1
ENVIRONMENTAL
ASPECTS
MEKONG RIVER COMMISSION
MRC
FOR SUSTAINABLE DEVELOPMENT

Lesson Learning Goals

At the end of this lesson you should be able to:

- Define and give examples of:
  - environmental aspects and environmental impacts
  - significant environmental aspects and impacts
- Give examples of activities and their potential environmental aspects and impacts
- Conduct a simple risk assessment for environmental aspects
- Participate in a process to determine significant environmental aspects and impacts

What are Environmental Aspects?

- Features of a company's operations, processes, activities, products, or services that can have an impact (good or bad) on the environment

  Examples:

  - » use of raw materials
  - » use of resources
  - » discharges to water, air, or land
  - » filling a storage tank with chemical or oil
  - » noise emissions
  - » effects of products when used

What is an Environmental Impact?

- A change (negative or positive) in the environment caused by an environmental aspect
- The environment includes:
  - air, water (i.e., surface and ground water), land
  - natural resources and raw materials
  - animals, plants, people, organisms
  - local, regional, and global issues
  - interactions between any of these

Instances of Environmental Impacts

- Reduced oxygen in a river due to waste water discharge
- Contamination of the air by particulate and/or gas (such as sulphur dioxide, carbon dioxide, nitrogen oxides)
- Ground contamination by oil or chemical
- Destruction of wildlife habitat
- Recycling of paper, metal, plastic, glass

Environmental Aspect Example

Maintenance of vehicles:

- Discharge of water used to wash vehicles
- Disposal of:
  - waste oil, oil filters, oily rags, oil spill absorbent
  - air conditioner CFC
  - used tyres and batteries
  - used vehicle parts
  - waste solvent used to clean engine parts

Environmental Impact Example

Maintenance of vehicles:

- Water or soil contamination from discharge of wash-water, or disposal of waste oil, filters, rags, spill absorbent, batteries
- Contamination of air, and ozone depletion from CFC disposal
- Use of land for disposal of tyres, vehicle parts; contamination of air if tyres are burned
- contamination of water and air by solvent disposal

ISO 14001 Environmental Aspects says:

The organisation shall establish and maintain (a) procedure(s) to identify the environmental aspects of activities, products, or services that it can control and over which it can be expected to have an influence, to determine those which have, or can have, significant impacts on the environment

Establish and Maintain a Procedure

Used frequently in the ISO 14001 Standard

Establish = develop, implement, set up

Maintain = keep up-to-date, accurate

Procedure = sequence of actions required to carry out a task

Aspects Definitions

What is meant by “it can control”?

- Operations that company management can directly affect by its decisions, such as:
  - product and process design
  - equipment selection
  - raw material use
  - emissions to the environment
  - waste minimization practices

Aspects Definitions (Cont'd)

What is meant by "and have influence over"?

- Requirements and expectations management can place on contractors and suppliers, such as:
  - use more environmentally-friendly materials
  - reduce amount of packaging
  - require supplier to take back empty containers for re-use or recycle
  - cover road and rail bulk shipments to prevent material blow-off

ISO 14001 Environmental Aspects also says:

- Ensure that environmental aspects related to significant impacts are considered when setting environmental objectives
- Keep the information up to date

Reasons for Identifying Environmental Aspects

- Guide the setting of new environmental objectives and targets as part of the commitment to continual improvement
- Focus operational controls on significant environmental aspects
- Reduce risks from significant environmental aspects
- Identify training needs

Include Supporting Services

Environmental aspects relate not only to manufacturing processes, but also to activities by support services such as:

- research and development
- design and engineering
- transport and storage of raw materials
- storage and transport of product
- packaging

Supporting Services (Cont'd)

- construction and maintenance
- office work
- laboratory
- cafeteria
- security and emergency response
- yard crews, clean-up
- purchasing, shipping/receiving, stores
- contractor and supplier activities

Aspects Identification

1. Identify all environmental aspects and potential impacts using small group process
2. Draw up an inventory of environmental aspects:

Department	Operation	Aspect	Impact
Maintenance	Vehicle repair	Waste oil disposal	Water, land contamination
Power generation	Boiler operation	Gas emissions	Air contamination
Production	Product washing	Waste water discharge	Water contamination

Aspects Identification (Cont'd)

- In practice, each operation will have a more detailed breakdown of tasks, for each of which there will be environmental aspects and impacts
- Environmental impacts need to be more detailed than illustrated here, e.g., specify type of water contamination (BOD, suspended solids, pH, toxic organics, metals, etc.), and air (carbon dioxide, sulphur or nitrogen oxides, particulate, etc.)

What is a Significant Environmental Impact?

One where the risk to the environment is above a threshold level

- Risk = Probability x Consequence
- where:
  - probability reflects frequency and likelihood
  - consequence reflects both magnitude and public perception

What is an Acceptable Risk?

- The organization's management determines what is an acceptable level of risk, taking into account the:
  - magnitude and frequency of potential environmental impacts
  - possible effects on legal liability, community, business, image, public relations

Criteria for Determining Consequence/Magnitude

- Severity and scope of environmental impacts
- Severity and scope of health and safety impacts
- Legal and business / financial consequences
- Effects on public image, public relations, and credibility

Scale of Consequence/Magnitude

Effects on the Environment or on Human Health

Score	Level of Effect
1	No significant effects
2	Minor adverse effects
3	Moderate adverse effects
4	Major adverse effects
5	Severe/catastrophic effects

Business/Financial Consequences

Score	Sample Criteria
1	Less than one day or $1,000
2	One day to one week or $5,000
3	One week to one month or $50,000
4	One month to six months or $500,000
5	More than six months or $5 million

Consequence/Magnitude Score

Criteria	Score				
Environmental impact	1	2	3	4	5
Health & safety impact	1	2	3	4	5
Legal/financial impact	1	2	3	4	5
Public relations/image/ credibility	1	2	3	4	5
Range of possible scores			4-20		

Scale of Probability

Score	Criteria
1	Not expected in the facility's lifetime (REMOTE)
2	Expected not more than once in the facility's lifetime (UNLIKELY)
3	Expected several times in the facility's lifetime (MODERATELY LIKELY)
4	Expected several times a year (VERY LIKELY)
5	Usual occurrence (CERTAIN or HIGHLY PROBABLE)

Control/Containment/ Mitigation Scale

Score	Sample Criteria
1	Excellent
2	Good
3	Adequate
4	Marginal
5	Poor/None

Probability/Frequency/ Likelihood Score

Criteria	Score				
Likelihood of occurrence	1	2	3	4	5
Level of control/protection	1	2	3	4	5

Range of possible scores 2-10

Public Perception

Consider:

- Concerns of the local community, interest groups, NGOs
- Political climate
- Foreign perspectives
- Cumulative environmental effects with other business activities in the area

Risk Ranking Example

Score	Risk Rating	Action
< 20	Acceptable	None required
21-50	Moderate	Review again soon
51-100	Undesirable	Act soon
101-200	Unacceptable	Act now

Risk Assessment Procedure

- Many options, e.g., HAZOP, FMEA, Checklists, What-if analysis
- KISS method is best, e.g.,
  - Assemble a group of knowledgeable individuals
  - Brainstorm ideas on each criterion for consequence and frequency
  - Put each idea on a Post-it® note on a wall
  - Consolidate ideas on each topic
  - Each person assigns a score (1-5) to every criterion
  - Use mean score of the group in significance table

Concluding Thoughts

Important points to remember are:

- Have a systematic process for identifying all environmental aspects and impacts
- Clearly assign responsibility, authority, and accountability for the process
- Include:
  - start-up and shut-down conditions
  - emergency situations
  - other types of potential abnormal conditions
  - previous activities at the site

Concluding Thoughts (Cont'd)

Additional points to remember are:

- Then assess risks to identify which are significant impacts and aspects
- Define criteria for assessing significance
- Define frequency with which environmental aspects will be reviewed (i.e., keep them up to date)

Concluding Thoughts (Cont'd)

More points to remember are:

- Review environmental aspects whenever there is a change to any raw material, process, product, or activity
- ISO 14001 does not specify documenting environmental aspects and impacts, but in practice it must be done