ISO 14001:2004 EMS Understanding Of Requirements Course

Delegate Workbook

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Section 1

Course Programme

Course Programme

Day 1

Registration and Introductions

Audit Process – Overview

Exercise 1 - Roles and Responsibilities

ISO 14001 and EMAS – Overview

Exercise 2 - Reviewing 1st part of Pre-Course Questionnaire

Identifying and Evaluating Environmental Impacts

Exercise 3 - Identifying Environmental Aspects and Impacts (Minter Case Study)

Environmental Legislation

Exercise 4 - Environmental Legislation

Auditing

Auditing To ISO 14001:2004

END OF COURSE

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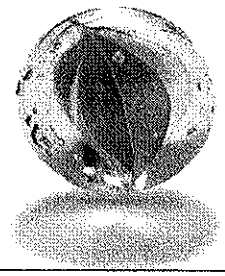
Section 2

Presentation Slides

EMS Understanding Of Requirements Course



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Welcome

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Introduction - Welcome

Delegate introductions

- Name
- Area of responsibility
- Knowledge of EMS standards
- Auditing experience (environmental/quality/health and safety)

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Introduction - Course Objectives

At the end of this course you will be able to:

- Understand what aspects and impacts are
- Understand the importance of legislation to the EMS and audit process
- Plan and carry out effective internal EMS audits
- Compile audit reports and evaluate appropriate effective corrective action
- Take away practical audit skills
- Identify additional competency requirements

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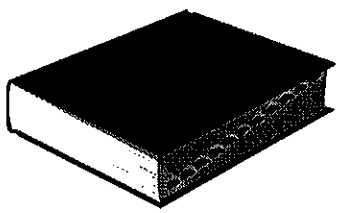
Introduction - Course Manual

Your course manual is your reference document for the course. A supplementary manual contains the case study



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Audit Process - Overview

The objectives of this module are to enable delegates to:

- Understand what 1st, 2nd and 3rd party audits are
- Reasons for carrying out audits
- Understand the audit life cycle
- The principal roles of the Internal EMS Auditor
- The roles of internal auditors, the environmental management representative and auditees
- Discuss internal EMS auditor competency requirements

Environmental Management System

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Audit Process - Overview

EMS standards all require EMS audits to be conducted.

ISO 14001 → Requirement for internal EMS audits

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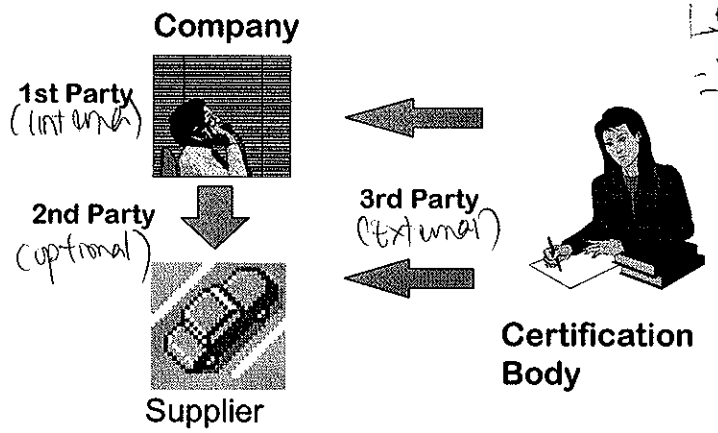
Audit Process - Overview

Types of Management System Audit



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Audit Process - Overview

EMS Audit is defined in ISO 19011 as:

- A **systematic, independent** and **documented** process for obtaining audit evidence and evaluating it objectively to determine the extent to which the environmental management system **audit criteria** set by the organization are fulfilled.

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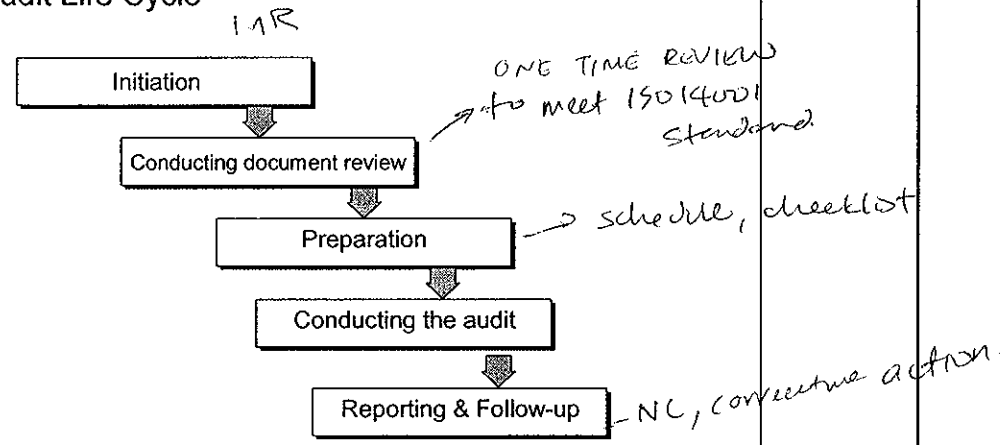
Audit Process - Overview

- Audit Life Cycle



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Audit Process - Overview

Environmental Management System Audits can comprise of a three stage evaluation:

1) DOCUMENT REVIEW	-	EMS versus ISO 14001:2004
2) IMPLEMENTATION	-	Objective evidence of activities versus the EMS documentation and procedures
3) EFFECTIVENESS	-	Objective evidence of the effectiveness of the EMS

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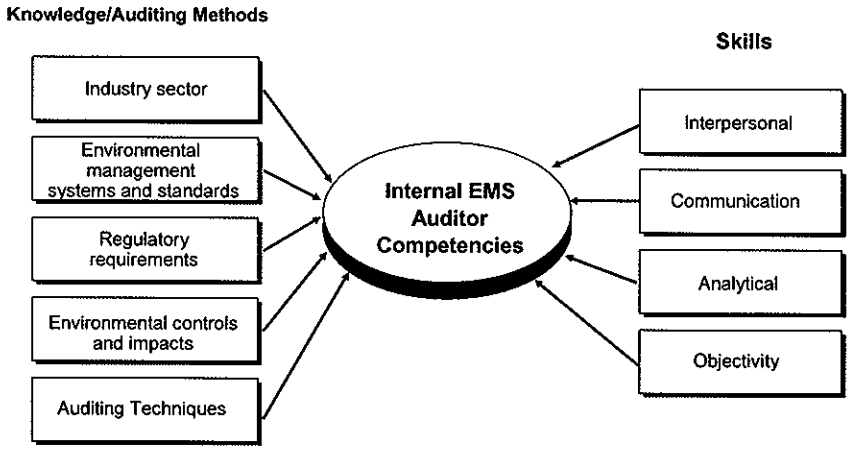
Audit Process - Overview

EMS auditors need to possess a degree of knowledge and skills.



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Audit Process - Overview

There are various bodies associated with audits of Environmental Management systems:

- Accreditation Bodies e.g. UKAS SAC Singapore Accreditation Council.
- Certification Bodies e.g. BSI

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Standard Requirements - Objectives

The objectives of this module are to:

- Understand the requirements of the key elements of ISO 14001:2004 standard

At the end of this module you will be able to:

- Know and interprete the requirements of the ISP 14001:2004 standard requirements

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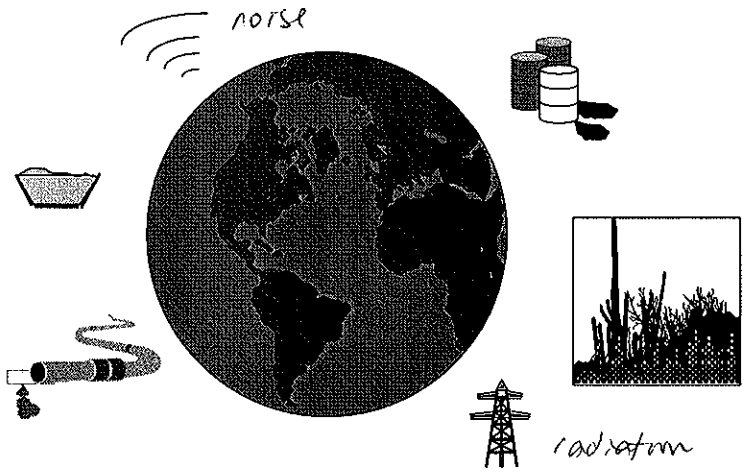
Environmental Impact Meaning

What do we mean by an environmental impact?



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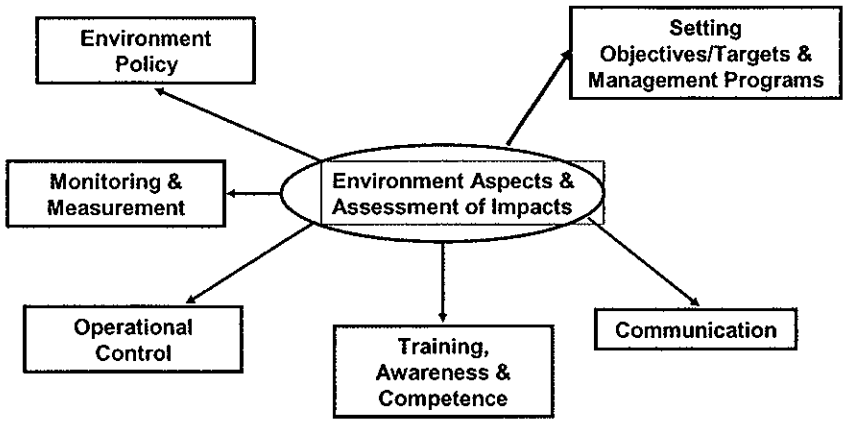
Linkages of ISO 14001:2004 Elements



- paper
- elect
- design

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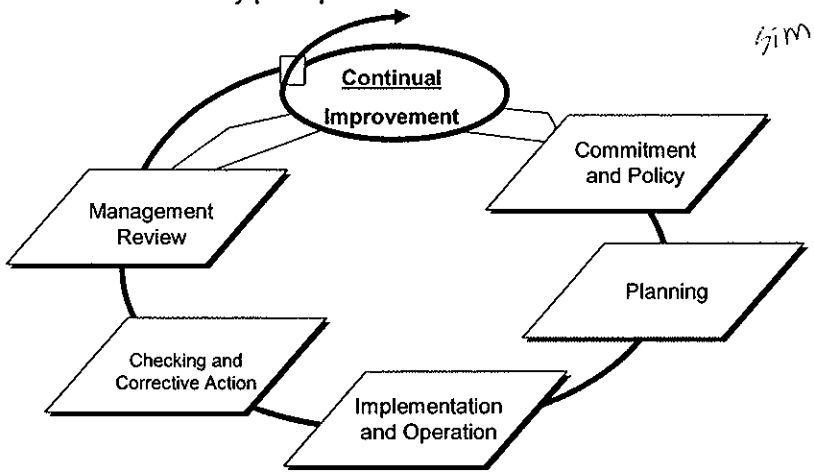
- Reduce
- Reuse
- Recycle.

Standard Requirements - ISO 14001:2004

The ISO 14001 EMS model follows the view of an organization which subscribes to five key principles.

similar to ISO 9001



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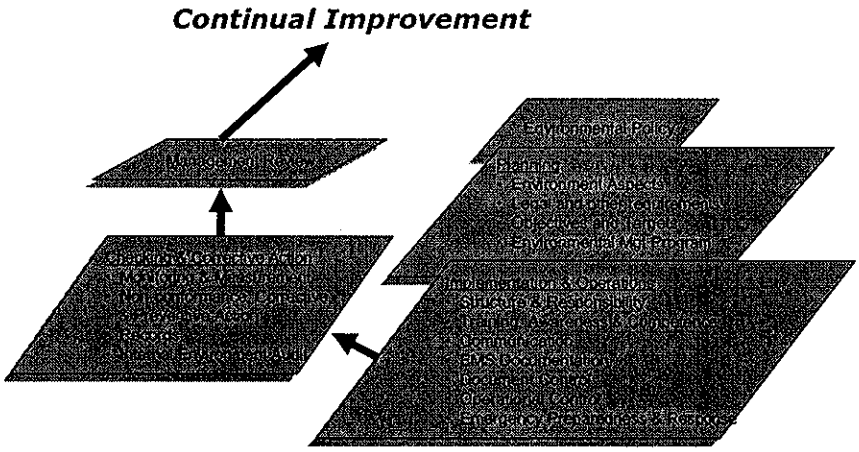
Standard Requirements - ISO 14001:2004

Overview of ISO 14001 Standard Requirements



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4.1 General Requirements

ISO 14001:2004 – 4.1

- Establish, document, implement and maintain EMS
- Continually improve system
- Define and document scope
- Ensure compliance with remaining clauses

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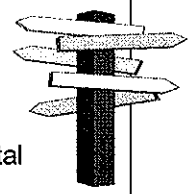
4.2 Environmental Policy

ISO 9001:2000 - 5.1, 5.3, 8.5.1



Top management commitment to:

- Define policy ***and within defined scope:***
- Ensure appropriate to nature, scale and environmental impacts of business
- Include commitments to:
  - Comply with applicable legal and other requirements it subscribes to
  - Continual improvement
  - Prevention of pollution
- Policy must:
  - Provide framework for setting and reviewing objectives and targets
  - Be ***documented,*** implemented, maintained and communicated to ***all persons working for or on behalf of the organization***
  - Be made available to the public

Employee contract party

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4.3.1 Aspects and Impacts

ISO 9001:2000 - 5.2, 7.2.1, 7.2.2



Establish, ***implement*** and maintain procedure(s):

- Identify ***(within the defined scope)*** the environmental aspects of its:
  - Activities, products and Services
- That it can control and have an influence, ***taking into account planned or new developments or modified activities*** to determine those which have a significant impact on the environment
- Must be considered in ***establishing, implementing and maintaining the EMS***
- Must be ***documented and*** kept up to date

Communication of aspect & impact of interested parties (optional.)

Management to decide and state in document.

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Aspect and impact

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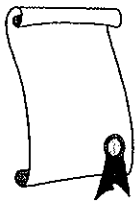
4.3.2 Legal and Other Requirements

ISO 9001:2000 - 5.2, 7.2.1

Establish, ***implement*** and maintain procedure(s):

Identify and have access to:

- Applicable legal or statutory requirements (LAWS)
- Other ***environmental*** requirements e.g.
- Codes of practice
- Customers' requirements
- Head Office requirements
- Non-regulatory guidelines
- Keep them up to date
- ***Determine how they apply***
- ***Consider in establishing, implementing and maintaining the EMS***



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4.3.3 Objectives,Targets and Programmes

ISO 9001:2000 - 5.4.1, 5.4.2, 8.5.1

- Establish, implement, document and maintain its environmental objectives and targets ***at relevant functions and levels***
- ***Measurable where practical***
- Ensure that they are consistent with its environmental policy
- When establishing and reviewing its objectives it shall consider its:
  - legal and other requirements;
  - significant environmental aspects;
  - technological options;
  - financial, operational and business requirements; and
  - the views of interested parties.



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4.3.3 Objectives,Targets and Programmes

ISO 9001:2000 - 5.4.1, 5.4.2, 8.5.1

- Establish, ***implement*** and maintain programme(s) for achieving its objectives and targets
- Include in its programme(s):
  - Designation of responsibility for achieving its objectives and targets
  - Means and timeframe by which they are to be achieved

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4.4.1 Structure and Responsibility

ISO 9001:2000 – 5.1 5.5.1, 5.5.2,6.1, 6.3



- Define, document and communicate roles, responsibilities ***and authorities*** to facilitate effective environmental management
- Ensure availability of resources ***(human, skills, organizational infrastructure, technology and financial)*** essential to the implementation and control of the EMS
- ***Top management*** to appoint specific management representative(s) who have defined roles, responsibilities and authority for:
  - Establishing, implementing and maintaining the system
  - Reporting on system performance to top management

MR can be different from ISO 9001

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4.4.2 Training, Awareness and Competence

ISO 9001:2000 – 6.2.1, 6.2.2



- Identify training needs
- Provide appropriate training to responsible staff
- Assign competent personnel
- ***Retain associated records***
- Establish and maintain procedures to make personnel ***performing tasks on its behalf that have the potential to cause significant environmental impact(s)*** aware of:
  - Importance of conformance with the environmental policy , procedures and requirements of EMS
  - Significant environmental impacts ***(actual or potential)*** of their work activities
  - Roles and responsibilities in achieving conformity with requirements
  - Potential consequences of departure from specified procedures

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4.4.3 Communication

ISO 9001:2000 - 5.5.3, 7.2.3

- Establish, ***implement*** and maintain procedures for:
  - internal communication between the various levels and functions of the organization
  - receiving, documenting and responding to relevant communication from external interested parties
- Make a decision on external communication of its significant aspects
- Record that decision and establish.
- Implement methods for external communication if necessary



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4.4.4 & 4.4.5 Documentation & Document Control

ISO 9001:2000 - 4.2.1, 4.2.3

- Describe ***main*** elements of the EMS and their interaction
- Include scope of EMS
- Provide reference to related documentation
- ***Include policy, objectives and targets, documents and records required by the standard plus others necessary to the effective planning, operation and control of processes related to significant environmental aspects.***
- Establish and maintain procedures to cover:
  - Approval for adequacy prior to issue
  - Review and update and re-approve
  - Availability of ***relevant*** version in all essential locations
  - Identification of changes and current revision status
  - ***Legibility*** and identification
  - ***Identification and distribution of relevant external documents***
  - Prevention of unintended use of obsolete documents
  - Identification of retained obsolete documents

identical to ISO-9001

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4.4.6 Operational Control

- Identify and plan relevant operations and activities associated with significant aspects
- Plan to carry out these activities under normal, abnormal and emergency conditions (including maintenance) and shall have:
  - Documented procedures where their absence may lead to deviations from policy, objectives and targets
  - Established operating criteria in the procedures
  - ***Establish, implement, maintain*** and communicate ***applicable procedures*** to suppliers and contractors

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4.4.7 Emergency Preparedness and Response

ISO 9001:2000 - 8.3

- Establish, ***implement*** and maintain procedures to:
  - Identify potential accidents and emergencies
  - Respond to them
  - Prevent and mitigate adverse impacts associated with them
- ***Periodically*** review and if necessary revise its emergency preparedness and response procedures
  - especially following an accident or emergency situation
- Periodically test such procedures where practicable

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4.5.1 Monitoring and Measurement

ISO 9001:2000 - 7.6, 8.1, 8.2.3, 8.2.4, 8.4

- Establish, ***implement*** and maintain procedures to monitor and measure regularly
- Cover key characteristics of its operations and activities
- Document information to
- Record information to track:
  - performance
  - Relevant operational controls
  - Conformance with objectives and targets
- Calibrate ***or verify*** and maintain all monitoring and measuring equipment used
- Retain records



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4.5.2 Evaluation of compliance

Establish, ***implement*** and maintain procedures to:

- Periodically evaluate compliance with relevant legal requirements and ***other environmental requirements subscribed to***.
- ***Keep records of evaluations***

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4.5.3 Nonconformity, Corrective & Preventive Action

- Establish, ***implement*** and maintain procedures to:
  - define requirements for identifying and correcting non-conformities
  - ***Investigate and determine cause(s) of actual nonconformity (ies), to avoid recurrence***
  - ***Evaluating the need for action to prevent non-conformities and implement actions to prevent occurrence***
  - Appropriateness of actions commensurate to scale of problem and impacts



- ***Review actions taken and*** implement and record resulting changes made to the EMS documentation

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4.5.4 Records

ISO 9001:2000 - 4.2.4

- Establish, ***implement*** and maintain procedures for:
  - Identification
  - Storage
  - Protection
  - Retrieval
  - Retention
  - disposal



- Ensure that records ***(including evaluation of compliance – see 4.5.2)*** are:
  - Legible
  - Identifiable
  - Traceable to the activity, product or service involved

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4.5.5 Internal Audit

ISO 9001:2000 – 8.2.2

no fix schedule for audit but industrial practise at least once a year.

- Establish, implement and maintain procedures and ***planned*** programmes for audits
- Base audits on environmental importance and previous results
- Ensure that EMS audits cover:
  - Scope, criteria and frequency ***(planned intervals)*** of audits
  - Methodologies used
  - Responsibilities and requirements for planning, conducting audits, reporting results and retaining associated records
  - ***Ensure impartiality and objectivity of auditors***
  - Reporting requirements
- Provide information to management review
- Demonstrate conformance, implementation and maintenance of the system



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4.6 Management Review

ISO 9001:2000 – 5.1, 5.6, 8.5.1

- Ensure top management involvement in the review
- Carry out the review at ***planned*** intervals
- Ensure the continuing suitability, adequacy and effectiveness of the EMS
- ***Include opportunities for improvement and changes to EMS, audit results, communication from external interested parties, performance of organization, extent of achievement of objectives, status of corrective and preventive actions, follow up from previous reviews, changing circumstances, recommendations for improvement.***
- Record the review
- Review output to include any decisions & actions to possible changes to:
  - Policy, Objectives, targets and other elements of the EMS, consistent with commitment to continual improvement

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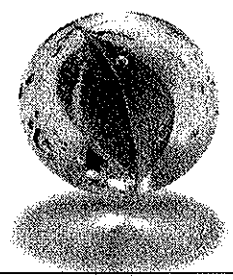
Identifying Environmental Aspects and Evaluating Impacts



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Objectives

The objectives of this module are to:

- Identify the range of environmental aspects and their impact
- Establish a systematic approach to identify environmental aspects and their impacts
- Review factors that determine significance

After this module you will be able to:

- Categories environmental impacts
- Identify what information you require to determine significance

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Knowledge of Environmental Aspects and Impact

- Those involved in internal EMS audits need to understand environmental impacts.
  - Impacts determine:
    - Scope and design of EMS
    - Policy
    - Objectives, targets and environmental management programme
  - An EMS will need to include:
    - Procedure to identify environmental impacts and determine significance
    - Adequate records of significant impacts

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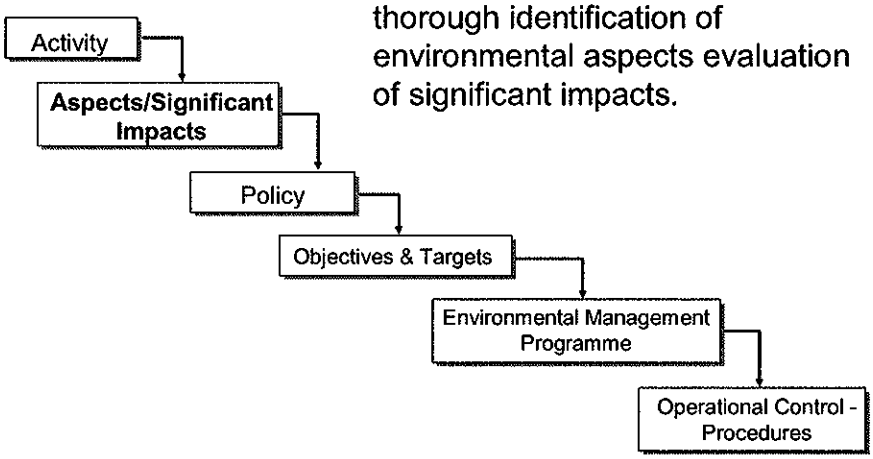
Relationship of Environmental Aspects and impact to EMS

- An effective EMS is based upon a thorough identification of environmental aspects evaluation of significant impacts.



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Definition of Environmental Aspects and Impacts

Aspect - (Cause) Element of an organization's activities, products or services which can interact with the environment.

Impact - (effect) Change to the environment resulting from an organization's activities, products or services .

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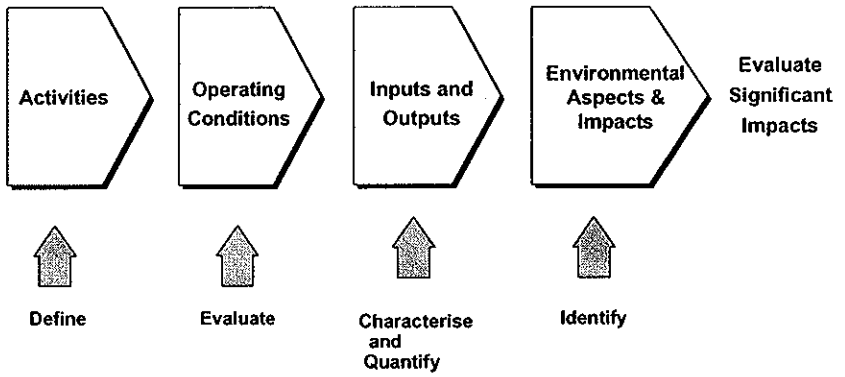
Identifying Environmental Aspects - Approach

We need a systematic approach to identify environmental aspect and evaluation of impacts.



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Identifying Environmental Aspects

When identifying aspects, the following shall be considered:

- Emission to air
- Discharges to water
- Generation of wastes (Land pollution)
- Use of raw materials, energy, water and other natural resources
- Generation of noise

a radiation

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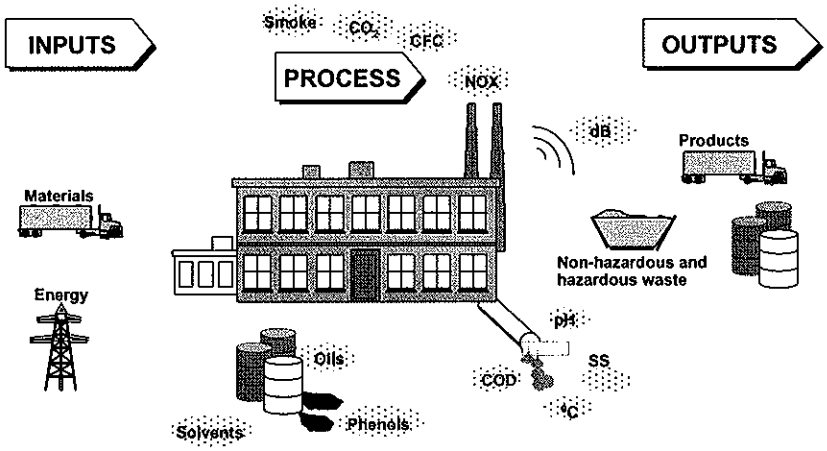
Identifying Environmental Aspects - Inputs, Process and Outputs

Environmental impacts arise from the consumption of resources and emissions to air, water and land.



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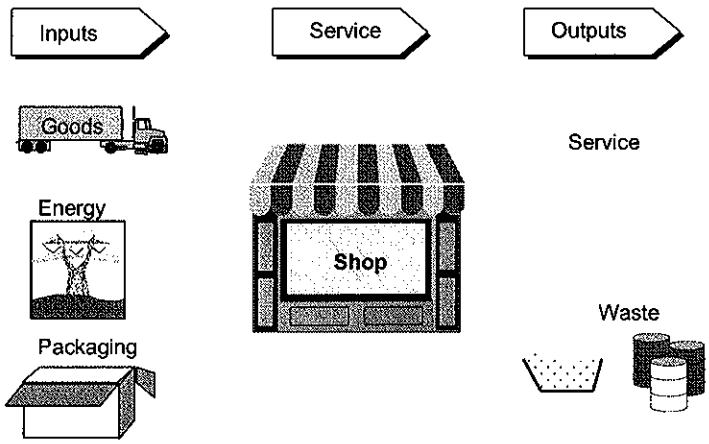
Identifying Environmental Aspects - Inputs, Process and Outputs

Service activities should also identify inputs and outputs



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Examples of Environmental Aspects & their Impacts

Aspects	Impact
Use of electricity	Global warming, depleting natural resource
Potential spillage of diesel	Land contamination
Emission of dark smoke	Air pollution
Noise emission	Ear damage
Waste water leakage to sewage	Water pollution
Use of paper	Depleting natural resource

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Examples of Environmental Impacts

Environmental impact is the consequence of intended pollutants' release. Environmental impacts can be categorized.

- Greenhouse effect
- Stratospheric ozone depletion
- Depleting natural resources
- Acid rain
- Surface water quality
- Bioaccumulation of toxins
- Local air quality
- Waste burden
- Noise pollution
- Soil & groundwater contamination

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Evaluation Significant Impact

- Frequency of occurrence
- Likelihood of detection
- Severity of consequences
  - Level of hazard
  - Quantity / Scale
  - Duration
  - Sensitivity of target
  - Barrier before reaching target
- Legal Compliance

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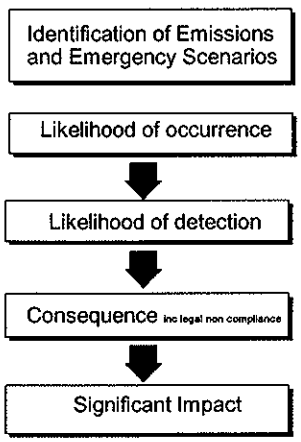
Evaluation Significant Impact



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Evaluating Significant Impact

- Typically ten questions:
  - Is the issue affected by legislation?
  - Is the issue affected by other requirements?
  - Does the issue have a visible impact?
  - Does the activity use non-renewable resources?
  - Do shareholders perceive the issue as important?
  - Do the regulators requires control of the issue?
  - Does the impact pose a threat to the environment?
- If any issue produces a "Yes" answer, then the issue is significant
- Typically legislation scores the highest weighting
- Sum[Yes] = Significance

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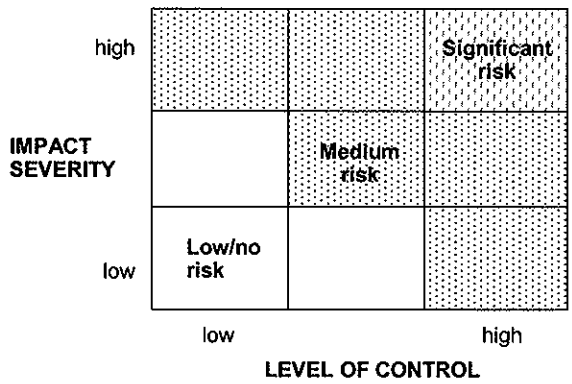
Method of Evaluating Significant Impact

Semi-quantitative risk audit techniques are used to identify significant impacts.



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Recording Evaluation Process of Impact

IMPACT ASSESSMENT FORM

S/N	Activity	Aspect	Impact	Legal (L)	Likelihood (F)	Severity (S)	Risk Level (L+F+S)	Additional Control

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Auditing Environmental Aspects/Impact

MR role.

- Procedure established and followed?
- Environmental Aspects identification carried out for activity, product and service.
- Impact evaluated? - Consistency
- List of Aspects - Adequacy.
- Are aspects and impact reviewed? yearly
- Consideration for setting objectives and targets. (option)

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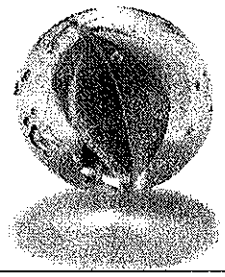
Module 5
Legislation



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Legal and Other Requirements

- Act
- Subsidiary Legislation
  - Regulations
  - Order
  - Rules
- Singapore Standards
- Code of Practices
- Other requirements - customers, corporate, etc.

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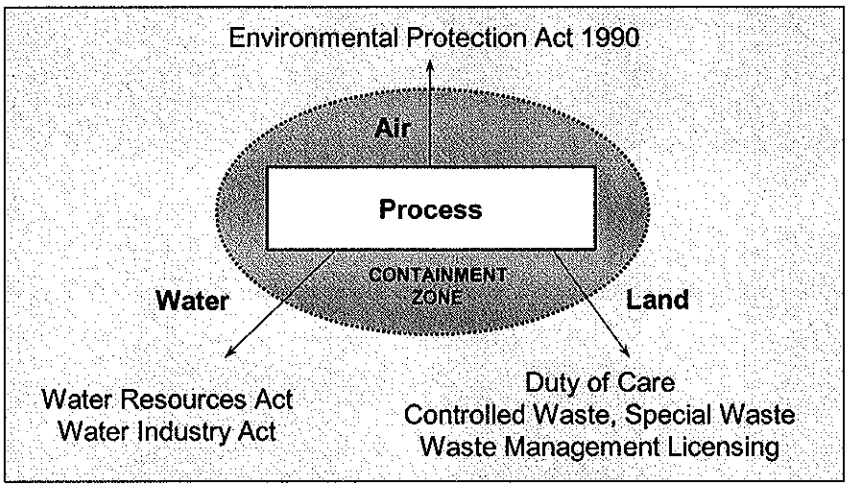
Environmental Related Legislation



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Environmental Related Legislation

- **Air Pollution**
  - Environmental Pollution Control Regulations
    - limit of air pollution
    - installation of air pollution control equipment
  - Environmental Pollution Control (Vehicle Emissions)
    - Emission and noise monitoring
    - Servicing
  - Code of Practice on Pollution Control
  - Code of Practice for Environmental Health

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Environmental Related Legislation

Water Pollution Control

- Environmental Pollution Control Act 1999
- Environmental Pollution Control (Trade Affluent) Regulation
  - Not to discharge without license
  - Allowable limits for discharge into watercourse
- Environmental Pollution Control (Hazardous Substances) Regulation 1999
- Sewerage and Drainage Act 1999
- Sewerage and Drainage (Surface Water Drainage) Regulation 1999
- Sewerage & Drainage (Trade Effluent) Regulations

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Legislation / Code of Practice

- **Waste Management**
  - Environmental Public Health Act (Chapter 95)
  - Environmental Public Health (Toxic Industrial Waste) Regulation
    - Types of toxic industrial wastes collectors
    - Engage licensed toxic industrial wastes collector
    - Keeping of inventory
  - Environmental Public Health (General Waste Collection) Regulations
    - Different classes of wastes and licenses
    - Engagement of licensed contractor
  - Code of Practice for General Waste Collectors

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Legislation / Code of Practice
Waste Control - Duty of Care

- Producers of waste are responsible for its correct disposal
- Waste carriers must have a licence
- Waste storage - transfer stations must have a licence
- Disposal sites - must have a licence
- Waste must be transferred to the correct disposal site
- Operators must have evidence to prove this

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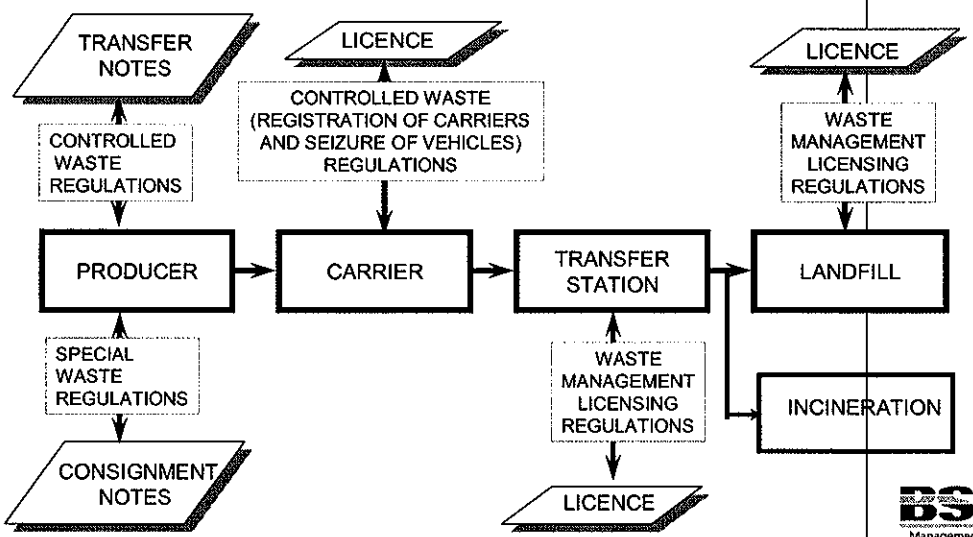
Legislation / Code of Practice
Waste Licensing Trail



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Legislation / Code of Practice

Chemical Management

- Environmental Pollution Control Act
- Environmental Pollution Control (Hazardous Substances) Regulation
  - License to transport, sell & import hazardous substances
- Factories Act / WHSA
  - Material Safety Data Sheet
  - Preventive of fire due to storage of flammable materials
- Control of Vectors and Pesticides
  - Licenses of pest control operator, technician
  - Approved pesticides
- Code of Practice on Pollution Control
- Guidelines on Prevention & Control of chemical hazard

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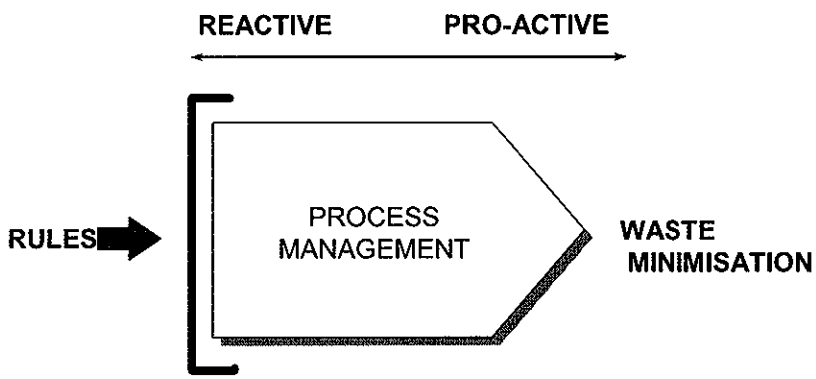
Environmental Management



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Auditing Legal Requirements

- Procedure established and followed?
- List of Legal & other requirements - Adequately and correctly identified.
- Are they associated to environmental aspects?
- Means of access?
- Updating of Legal & other requirements?
- Communication of Legal & other requirements to staff

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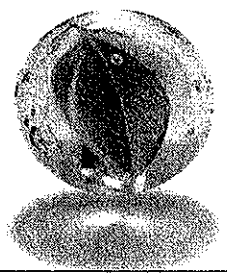
ISO 14001 Management System Audit



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Session 1 – Introduction to Management System Auditing

Overview

After this session, delegates will be able to explain the 'what' and 'why' of auditing. Some aspects of ISO 19011:2001, on which this course is based will also be introduced.

Session Objectives

After this session you will have an understanding of :

- The definition of quality systems audit
- Of the requirements for auditor independence
- What first, second and third party audits are
- Of the purpose of ISO 19011: 2001
- The audit purpose
- Audit objectives
- Other reasons for auditing

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Audit Definition

Systematic, independent and documented **process** for obtaining evidence and evaluating it objectively to determine the extent to which **audit criteria** are fulfilled

ISO 9000 : 2000
Definition 2.9.1

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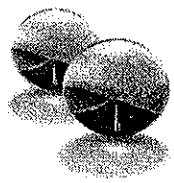

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Section 3

Course Notes

Course Notes

Chapter 1	Introductions
Chapter 2	Business and the Environment
Chapter 3	Audit Criteria – An Overview
Chapter 4	ISO 14001:2004 Requirements
Chapter 5	Aspects and Impacts
Chapter 6	Legal and Other Requirements
Chapter 7	Some further sources of information

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Chapter 1
Introductions

1. Course Objectives

This course has been designed to provide delegates with the tools and techniques necessary to plan and carry out an audit of an environmental management system. The main objectives are to enable delegates to:

- Understand the business reasons and benefits to having a formal EMS
- Define the following terms: EMS audit, internal and external audits, first, second and third party audits, environmental aspects and impacts, observations, non-conformity, objective evidence
- Explain the purpose and benefits of the various types of audits
- Understand the structured approach to audits
- Identify the factors which are important to consider when compiling an audit schedule/programme
- Prepare to conduct an audit
- Prepare audit checklists (aide memoires)
- Conduct audit interviews, observe processes and examine documents to obtain objective evidence about the status of an EMS
- Prepare audit reports to enable appropriate corrective actions to be initiated
- Prepare and present verbal and written audit reports
- Decide on an appropriate follow-up audit

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Chapter 2
Reasons for implementing an EMS

The environment is a broad term covering a multitude of areas. It encompasses the internal working environment as well as the external environment in which the organization operates. ISO 14001 defines the meaning of the environment as it is to be understood in relation to the standard, together with associated terms "aspects", "impacts" in section 3. These definitions are important not only to ensure that the system is correctly set up but also for auditors to ensure they correctly understand them.

3.5 Environment
"surroundings in which an organization operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelationship"

3.6 Environmental Aspect
"element of an organization's activities, products or services that can interact with the environment"

3.7 Environmental Impact
"any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services"

The standard also notes that a significant environmental aspect is one that has or can have (potential) a significant environmental impact. It is important to understand that the term "impact" is neutral and has to be preceded by the words "adverse" or "beneficial". This perception can be influenced by the views of interested parties. The term "significant" is not defined in the standard but as such it is up to the organization itself to define the criteria by which it identifies which ones are significant. This issue is explored in more detail in the modules that follow.

Every organization's activities, products or services do or can give rise to aspects and associated impacts. Consider what you have done during the past week, e.g. driving your car, mowing the lawn, going shopping etc. Businesses consume raw materials, use energy and generate waste streams. We either impact on the environment by depleting resources or polluting the environment.

Sometimes these impacts can be catastrophic, e.g. Chernobyl, Exxon Valdiz, Bhopal. In addition the organization will face costs associated with increasing legislation. As you can see from the examples given above, the costs of failure in the environment are likely to be far greater than those for quality where a failure may simply mean re-working a piece of raw material or throwing a sub-standard component in the scrap bin.

Increasingly organizations are being asked how they manage their environmental issues by a wide range of people and organizations. ISO 14001 defines these as interested parties (see 3.13). The following text gives some examples of these interested parties and gives some reasons why they would be interested in the environmental performance of your organization. These motives range from protecting investments to protecting health.

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Local Authorities are being encouraged by Central Government to participate in the Local Authority Eco-Management and Audit Scheme (LA EMAS) themselves. Local government is already responsible for managing the planning system, as well as certain aspects of integrated pollution control. They are also responsible for monitoring noise nuisance and collecting and disposing of most wastes.

Financial Institutions lending policies are already affected by environmental considerations include the main high street banks and any venture capital. Financiers now use the company stance on the environment as in indicator of forward-thinking management – i.e. environmental management is simply good business management – It is no longer considered a "fringe" activity.

Insurance Companies' policies are affected by the presence of an environmental management system. They do not yet offer formal reduction of premiums but they do take into account an EMS as an indicator that environmental risks and liabilities are being managed effectively.

Pension funds are the single largest investors in the UK. They are by their nature conservative investors. They too are now using the presence of an EMS as an indication of a stable business. Risk audit from the financial viewpoint can affect company credit ratings which can be affected by the overall state of management systems, particularly if they are recognised by a third party.

Local communities are often left out and not thought about by organizations, but they supply the workforce, and the local inspectors, as well as being part of the local environment. This list is not exhaustive and you may be able to identify others relevant to your business.

Environmental management systems allow the organization to focus holistically on its business activities and how they interact or affect the wider environment. The EMS approach encourages the organization to:

- bring together information on its activities, products and services;
- understand the environmental aspects of its business activities;
- break down environmental information and data into manageable chunks;
- analyse the information collected; and
- prioritise its responses in order to improve its overall environmental performance.

The EMS approach allows you to address the issue of environmental liability by forcing you to identify your environmental impacts and the measures required to reduce them. By formulating an environmental policy, setting objectives and targets, and using management programmes to provide the framework for achieving them, the organization is able to demonstrate a pro-active stance towards environmental responsibility.

Using recognised and internationally accepted EMS standards also provides a sense of security to all interested parties, including regulators, as they know what hoops the company has had to jump through in order to achieve certification. Whilst initial environmental review is only considered in Annex A to ISO 14001 and does not form an assessable part of the standard, it is a mandatory and assessable part of the EMS under the EMAS Regulation.

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Where to Start

For a company with no existing EMS it will need to understand its current position. ISO 14001 gives guidance in Annex A on how to tackle this by means of an initial review. It suggests that during an initial review the following activities should be covered.

- Identify all relevant activities, products and services over which the site has direct management control or which it may be expected to have an influence over.
- Identify material inputs and all outputs to air, water and land.
- Characterise and quantify all these inputs and outputs.
- Consider normal, abnormal and emergency situations, as well as past, current and future activities.
- Establish all performance requirements including regulatory requirements.
- Determine the effectiveness of existing management systems in controlling the risks and in meeting identified performance requirements.
- Implement stronger systems of control where performance does not meet requirements, risks are high, or eliminate the risks.

When looking for areas of environmental performance improvement try to ascertain those impacts which may yield the highest levels of improvement and the most cost-effective opportunities. This will help you to prioritise your impacts reduction programmes through the use of objectives and targets.

Both ISO 14001 and EMAS require organizations to consider the views of interested parties when determining the significance of their impacts/effects. Given this requirement, be wary of relying entirely on cost-benefit analysis and environmental resources are notoriously difficult to place a monetary value on.

Resource consumption can be measured in a number of ways – from a simple analysis of utilities bills and purchasing records to the use of mass balance equations, which attempt to quantify the inputs, outputs and wastes arising from a business activity.

When you are undertaking an initial environmental review consider the categories into which you place your identified aspects and impacts and the significance criteria you will use to rank them. To be meaningful and repeatable significance criteria should be clear, concise and consistent.

It is also important to understand which aspects and impacts you have direct management control over or may be reasonably expected to have some influence over. You will probably need to consider which subcontractors and suppliers you can influence in order to improve not just their environmental performance but yours as well!

Sometimes impacts may not be immediately evident. For example, does your organization fully understand the implications of its own investment policies or the lending policies of financial institutions? Most banks and finance houses now apply environmental criteria within their lending policies.

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Evaluation Tools
It is important to understand the difference between audit types and the different reasons for undertaking them. The following terms are often encountered and do fully satisfy the requirements of ISO 14001 in themselves:

Environmental audit:	focuses on environmental impacts and liabilities of a site's existing activities
Compliance audit:	focuses on verifying regulatory compliance
Acquisition or transaction audit:	focuses on examining environmental liabilities that could be acquired
EIA audit:	focuses on verifying compliance with EIA predictions
LCA:	life cycle audit for looking at product related environmental impacts

ISO 14001 defines an EMS audit as:
"A systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which the EMS audit criteria set by the organization are fulfilled"

There are different "levels" of audit:
- **1st party audit** (internal audits)
- **2nd party audit** (customers or potential customers auditing your EMS or your company auditing your suppliers or potential suppliers)
- **3rd party audit** (independent certification audits, e.g. BSI, Lloyds, DnV, etc.)

In addition depending on the type of audit the auditor may have to make judgements on the **Intent, Implementation and Effectiveness** of the EMS.

The audit of **intent** involves comparing the documented EMS against the requirements of the chosen standard, e.g. ISO 14001, and ensuring that all the requirements have been adequately addressed. This may be carried out on site or off site depending on the policy of the auditing organization.

The audit of **implementation** must take place on site and involves a judgement as to how well the company is following its own policy and procedures. Additionally the auditor should judge how **effective** the system is in delivering the goals and objectives of the organization. Is the system capable of assuring regulatory compliance and is it designed to and is it achieving continual improvements.

This course is intended to address a basic approach to any type of EMS audit, namely a Plan, Execute, Report and Close out sequence (PERC). However, the basic concepts are equally applicable to 1st, 2nd and 3rd party audits.

There are different reasons for carrying out audits and they are as follows.
First Party
- As a control mechanism
- A tool for identifying improvement opportunities
- ISO 14001 requires them

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Second Party
- As a means of evaluating new suppliers and contractors
- To assist in developing existing suppliers

Third Party
- Market recognition
- Reduced need for second party audits

Audit Responsibilities
ISO 19011:2002 is the guidance document for quality and/or environmental management systems auditing. Responsibilities can include:

Lead Auditor
- establishing initial contact with the auditee
- confirming the scope and objectives of the audit
- obtaining relevant background information
- conducting document review
- preparing the audit plan
- forming the audit team
- communicating the audit plan
- co-ordinating preparation of working documents
- directing activities of the audit team
- resolving problems
- recognising when audit objectives become unobtainable and reporting reasons to the client and auditee
- representing the audit team in discussions with the auditee
- notifying auditee of critical audit findings
- determining whether the requirements for an environmental audit have been met
- reporting to the client clearly and conclusively within the time agreed
- making recommendations for improvement if agreed within the scope of the audit

Auditor
- applying audit principles, procedures and techniques
- following the directions of and supporting the Lead Auditor
- planning and carrying out assigned activities objectively, efficiently and effectively within the scope of the audit
- collecting and analysing relevant information
- verifying accuracy of collected information
- determining audit findings
- preparing working documents
- documenting findings
- safeguarding documents
- assisting in writing the report

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Auditee

- informing employees about the scope and objectives of the audit
- providing facilities needed for the audit team
- appointing responsible and competent staff to accompany members of the audit team
- providing access to facilities, personnel, relevant information and records
- co-operating with the audit team

Auditor attributes and skills include but are not limited to the following

- ethical
- open minded
- observant
- competence in expressing concepts and ideas, orally and in writing
- interpersonal skills
- diplomacy, tact and ability to listen
- maintain independence and objectivity
- methodical and organized
- good judgement
- self reliant
- industrious
- practical
- professional

IS0 14001 specifies certain responsibilities of the Management Representative

- to establish, implement and maintain the EMS
- to report to top management on system performance as a basis for improvement

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Chapter 3
Audit Criteria – An Overview

From the previous section and the definition of an EMS audit it is apparent that in order for the auditor to carry out his/her task effectively they need to know what the basis for the audit is. The audit criteria can contain some or all of the following depending on the objectives and type of audit being carried out.

- ISO 14001
- EMS documentation and procedures
- Legal requirements
- Codes of practice
- Corporate policies
- Customer requirements
- Certification/Accreditation bodies requirements

British industry led the world in EMS standards development. The UK not only produced the first national specification standard for EMS but also lobbied heavily in the European Commission to shape the content and format of the EMAS Regulation. The UK, through BSI, holds the international secretariat to ISO/TC207/SC1, the ISO subcommittee responsible for producing ISO 14001 and ISO 14004.

The UK also holds the Secretariat to CEN/PC7/WG "EMAS", the working group responsible for producing the Bridging Document between ISO 14001 and EMAS (and available as part of the BSI EMS Handbook). This working group has recently commenced work on a new European Standard for the production of Environmental Statements under the EMAS Regulation.

Both these documents are subject to periodic review and are revised where necessary.

EMAS and ISO 14001 share common elements, which include the following:

Policy:	Statement of intent on managing environmental effects arising from the activities of the site
Organization & Personnel:	Definition of responsibilities, authority and verification resources, provision of training programmes, clear communication and reporting channels
Environmental effects:	Procedures to track and record regulatory requirements, significant environmental effects and communications with stakeholders
Objectives & targets:	Procedure to set and review objectives and targets for improving performance
Management programmes:	Programmes designed to ensure objectives and targets will be met and environmental issues included in projects

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Management manual:	Not mandatory under ISO 14001 – controlled documentation detailing the environmental management system, i.e., policy, procedures, responsibilities, objectives and targets
Operational control:	Procedures to manage and control the impact activities are having on the environment and for verifying controls are effective
Records:	Data to demonstrate how operations are performing against policy, objectives and targets (i.e. monitoring data, training records, waste shipments)
Audits:	Programmes to conduct frequent audits of the performance of the overall management system
Reviews:	Reviews conducted to establish continuing appropriateness of the management system and policy

The main differences between EMAS and ISO 14001 are:

- EMAS requires the publication of an Environmental Statement (see above), ISO 14001 only requires that an organization considers external communication.
- EMAS requires a maximum 3-year audit cycle, ISO 14001 only requires "periodic" EMS audits.
- EMAS contains several very prescriptive annexes, containing "shopping lists" of what an organization should include in its EMS, audit programmes and statement.

EMAS requires the completion of an initial environmental review which is then an assessable part of the EMS, unlike ISO14001 which does not include a requirement for IER but does suggest the need for an IER when an organization does not have an existing EMS.

An EMAS Lead Verifier leads the verification process only, and the Lead Verifier may not be the same person as the Lead Auditor in an EMS audit team; depending on whether the Lead Auditor is also a qualified EMAS Verifier.

Relevant Bodies

There are various bodies that may need to be considered when auditing an EMS, depending on whether it is an internal or external audit. These are:

The national accreditation body audits the certification body's procedures, competencies and expertise and then accredits the certification body as competent to issue certificates to organizations across a range of pre-defined industry sectors.

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Guidance issued by accreditation bodies is often highly informative and useful in that it provides outside organizations with an understanding of the roles and responsibilities placed upon certification bodies by the national accreditation bodies. Such guidance also provides an indication of the priority areas for certification audits.

The accreditation guidance for EMS has gone through considerable change. In March 1997 the European Accreditation of Certification (EAC) Guidelines (Document) were adopted, replacing the BS 7750 based guidance (AU/2/25) originally issued by UKAS.

In June 1997 the International Accreditation Forum (IAF) published guidance on the application of the ISO/IEC Guide 62 (1996) to EMS certification. The IAF guidance supersedes the EAC G/5 and the yearlong implementation phase began in April 1998.

ISO/IEC Guide 62 was also revised by an ISO/CASCO Working Group to apply specifically to EMS certification.

The IAF has now revised its guidelines to be applicable to the new ISO/IEC Guide 66 which was published in June 1999. EA recommended to its members that the IAF Guidance document be adopted as EA Guidelines in place of EA-7/02 First Edition. This was approved and therefore the present document contains the original version of the IAF guidance on the application of ISO/IEC Guide 66 – Issue 1, in an EA cover.

The certification body then assesses the organization against the requirements of a specification standard (e.g. ISO 14001) or established EMS model (e.g. EMAS) and makes a decision on whether to issue a certificate based on objective evidence that the necessary documentation is in place, the EMS has been implemented and is adequate and effective.

The organization implements an EMS based on the requirements of the standard/scheme upon which it wishes to base its EMS, and then selects a certification body according to its needs, corporate culture and the industry sector in which it operates.

In the case of the EMAS Regulation, the EMAS Verifier may be part of the certification body or a separate entity.

The competent body is the body in each Member State of the EU charged by the European Commission as being responsible for registering EMAS verified sites and monitoring activity and participation in the EMAS scheme. The competent body also offers advice to sites wishing to be verified to the scheme. For the UK this body is the Institute of Environmental Management and Assessment (IEMA).

ISO stands for the International Organization for Standardisation – the body responsible for co-ordinating international standards-writing activity.

CEN is the European Standards-writing body and co-ordinates standards development in Europe.

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The European Commission (EC) also generates its own guidance for EMAS Verifiers on the processes and procedures they must follow when verifying an organization's Environmental Statement. The EC also provides special guidance on such issues as how to verify a site with an existing ISO 14001 certificate, which also wishes to be registered to the EMAS Regulation.

This will be eventually be superseded by the planned EMAS supplement to the IAF guidance. _All the above points will be undertaken by UKAS irrespective of whether a verifier is being employed by an organization, or is functioning as an individual. However, if applying for individual recognition, the verifier would have to meet all the requirements of the certification bodies outlined in the main EAC/G5 document.

Auditing Guidelines
ISO 19011 was published in October 2002 and replaced quality and environmental management system auditing guidelines. ISO 10011 and ISO 14010, 14011 and 14012.

Its main headings are:
1. Scope
2. Normative references
3. Terms and definitions
4. Principles of auditing
5. Managing an audit programme
6. Audit activities
7. Competence and evaluation of auditors

- Auditors who have completed only secondary education or equivalent should have a minimum of five years appropriate work experience. Auditors who have obtained a degree should have a minimum of four years relevant work experience. An auditor should have completed on-the-job training for a total of 20 equivalent workdays of environmental auditing, and for a minimum of four environmental audits, under the direction and guidance of an audit team leader.

- Lead auditors should have participated in the entire audit process for a total of 15 additional workdays of environmental auditing, for a minimum of three additional complete environmental audits; and participation as acting lead auditor, under the supervision and guidance of a lead auditor.

Additional requirements for EMAS Verifiers
Documentary check on competence: The individual's professional qualifications and experience are checked with respect to the scope of the accreditation applied for. Recognition may be given to professional registers and membership of professional bodies judged to confirm the required status, e.g. IEMA or IRCA registration.

Evidence of effective practice/witnessed verification: The individual's practical EMS audit work is checked against the relevant requirements of EAC/G5 by such means as direct witnessing, or by post audit, or by evidence from organizations (for example, accredited certification bodies) for whom the individual has worked in a relevant capacity or by combinations of these.

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Interview to test statement validation: A panel, possibly involving a peer group, tests applicants on their understanding of what constitutes a complete, reliable and balanced statement.

Special note: The quality control requirements in EMAS Annex III may have to be met by some form of association with other individuals.

Declaration: The applicant will be required to make a declaration to UKAS, undertaking to act impartially and not to take on work that would introduce conflicts of interest or which is beyond his accredited competence.

Examination of Environmental Review: The verifier must be capable of establishing that the environmental review required in article 3b of EMAS covers all the issues listed in Annex 1 Part C. This is a specific requirement, and is in excess of any standard.

Examination of Internal Audit: Annex IIIB of EMAS requires that verifiers investigate the "technical validity" the audit (in addition to the environmental review and other procedures) without unnecessarily duplicating those procedures.

Examination of reliability of data: The verifier has to establish the technical validity of the data derived from the audit and review processes. Over and above recognition of the data being derived from a certified EMS (remember that many companies undertaking EMAS for the first time will not have had a certified EMS running long enough to produce the all data), UKAS will pay special attention to the verifier's competence in establishing the validity of data used to perform the following purposes:

- sampling and testing facilities, location of sampling point and access
- sampling and testing protocols
- equipment calibration and maintenance
- sampling, measurement and monitoring frequencies
- data recording and control
- information compilation, aggregation and consolidation
- evaluation and estimation techniques (including mass and energy balances)

Adequate coverage of statement: Verifiers must ensure that the environmental statement covers the significant issues of relevance to the site, though the statement would cover wider issues. Verifiers are also required to demonstrate that they can understand what is meant by fairness of presentation of information in the regulation. They must be able to understand the possible inferences and alternative interpretations open in any statement or part of the statement.

Extra provisions of regulation Annex 1.D: Over and above EMS standard requirements, EMAS requires provision for co-operation with public authorities and customers.

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Non-compliance reporting: In addition to the non-compliance reporting required by EMS standards, EMAS verifiers must also demonstrate that they can specify:

- technical defects in the environmental review, or audit method, or EMS or any other relevant process.
- points of disagreement with the draft environmental statement, together with details of the amendments of additions that should be made to the environmental statement

Establishing audit frequency: Audit frequency established may differ from the EMS audit/continuing audit cycle. Verifiers should work within the guidelines provided by the European Commission.

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Chapter 4
ISO 14001:2004 Requirements
ISO/FDIS 14001:2004 Requirements

CLAUSE 4.1 – General Requirements
An organization needs to establish, document, implement, maintain and continually improve its environmental management system to manage and control its activities, products and services which do or can give rise to significant environmental impacts. In determining how this will be done the organization has to ensure conformance with the remaining clauses in section 4.
In addition the 2004 version of the standard requires that the scope of the environmental management system is defined. Where this is done it does not say but could be included in a top level Environmental Manual for example. Care should be exercised in determining the level of documentation required e.g. documented procedures to avoid overly bureaucratic systems.
In the definitions section 3 of ISO 14001:2004 it makes the point that procedures can be documented or not (def.3.19).
It is important to recognise the system is there to deliver improvements in environmental performance.

Note: in the introduction to ISO 14001:2004 it mentions that the standard is based on the methodology of Plan, Do, Check and Act. Also it mentions that some organizations manage their operations via the application of a system of processes and their interactions such as ISO 9001:2000. Since PDCA can be applied to all processes the two methodologies are considered to be compatible.

CLAUSE 4.2 – Environmental Policy
Please note corresponding clauses for the equivalent QMS Standard, ISO 9001:***2000***, (where appropriate) in the title box of the accompanying slides for the remainder of this module.

It is claimed that 90% of environmental problems are a result of a lack of an environmental policy and the lack of management systems to put it into practice. A policy should be good for business. If not it will disintegrate when faced with commercial or economic pressures.

Basically, an environmental policy is a short written statement explaining your business position on the environment. The contents of the policy should be kept reasonably "high level" to avoid undue complexity. It is therefore important to set a balance between the level of detail required to satisfy stakeholders and provide a framework for the setting of objectives and the need for a clear, concise and accessible policy statement. Everything in the statement should ideally fit onto a single side of A4 paper, or perhaps a pocket-sized card.

Clause A.2 of ISO 14001 also stipulates that the environmental policy should be sufficiently clear to be capable of being understood by internal and external interested parties (in the 2004 version the phrase 'working for or on behalf of the organization' has replaced 'employees' and similar phrases in many parts of the standard), and should be periodically reviewed and revised to reflect changing

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conditions and information.

CLAUSE 4.3.1 – Environmental Aspects and Impacts
The relationship between an environmental aspect and an environmental impact is one of cause and effect - with an aspect leading to an impact or impacts.
The 2004 version now states that this relates to aspects 'within the scope of the EMS'
Remember the following factors/subject areas should be taken into account:

- Normal and abnormal operations start-up and shut-down situations.
- Potential emergency situations.
- Past, current and likely future activities, products and services.

Although not strictly part of the requirements of the standard, an initial review to establish an organization's position with respect to the environment is recommended in Annex A.1 to ISO 14001. For those organizations without an existing EMS an initial review is essential.
Information on aspects and significant impacts are now required to be documented.

CLAUSE 4.3.2 – Legal and other requirements
The organization must be capable of demonstrating that it has put in place procedures to identify and have ready access to details of all legislation (particularly environmental legislation and regulations) applicable to the environmental aspects of its activities, products and services.

It is vitally important that the organization has systems for identifying, fully understanding, and constantly reviewing and updating its knowledge of regulatory requirements. The organization should establish a list of all laws and regulations relating to its activities, products and services.

These regulations may exist in several forms, including those specific to the organization's activities (e.g. site planning or permissions), those specific to the organization's processes and operations or industrial sector (e.g. operating consents and conditions, permits, etc.), and general national or local authority environmental regulations (including local bylaws). Legislation may be based on local, regional, national, European or international requirements.

The organization should also include the requirements of other schemes and voluntary agreements to which it subscribes, e.g. codes of conduct, industry best practice schemes, and voluntary agreements with the local community in its procedures.

Internal priorities and criteria should be developed and implemented where external standards or schemes do not meet the needs of the organization or are non-existent. These will assist the organization in developing its own objectives and targets.

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CLAUSE 4.3.3 – *Objectives, targets and programmes*

When setting objectives and targets the organization needs to consider a number of issues, namely:

- The views of interested parties.
- Its significant impacts.
- Legal ***and other*** requirements.
- Technological options.
- Financial, operational and business requirements.

It is worth noting that Clause A.3.3 of ISO 14001:***2004*** indicates that objectives should be specific and targets should be measurable wherever practicable to allow effective auditing of the EMS, and where appropriate should take preventative measures into account. Clause A.3.3 also states that the reference in Clause 4.3.3 to the financial requirements of the organization is not intended to imply that they are obliged to use environmental cost-accounting methodologies when setting their objectives and targets.

The environmental management programme is the mechanism by which environmental objectives and targets can be met. An organization may choose to develop and implement more than one programme to achieve the same objective. Similarly, it may be possible to set up one programme, which has a positive effect on a number of environmental aspects or impacts at the same time. For example, should an organization choose to move away from using solvent-based paints in its spraying operations, and use water-based paints with an electro-static system (to attract the new paint to the object being painted and reduce wastage to the air), then it will reduce its emissions of volatile organic compounds (VOCs) and particulate matter, remove the need for VOC authorisations, minimise its paint wastage *and* improve the work environment in which its staff operate.

An environmental management programme should be drawn up to address all the organization's environmental objectives. To be most effective, environmental management planning should be integrated into the organization's overall strategic plan. The programme should address issues such as schedules, resources and responsibilities for achieving the organization's objectives and targets.

The programme should identify specific actions in order of their priority to the organization. These actions might deal with individual processes, projects, products, services or sites.

CLAUSE 4.4.1 – *Resources, Roles, Responsibility and Authority*

Responsibility for the overall effectiveness of the EMS should be assigned to (a) senior person(s) or function(s) with sufficient authority, competence and resources. This person is responsible for reporting on the performance of the environmental management system to top management for review and as the basis for improvement (see clause 4.6). In the light of stronger emphasis on the evaluation of compliance with legislation this should also be included.

Operational managers should clearly define the responsibilities of relevant personnel and be responsible and accountable for effective implementation of the EMS and environmental performance. Employees at all levels should be accountable, within the scope of their responsibilities, for environmental performance in support of the

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overall environmental management system.
Clause ***4.4.1*** of ***ISO 14004:2004*** *"Resources – Human, physical and financial"* calls for the determination and availability (in a timely and efficient manner) of appropriate human, physical (e.g. facilities, equipment), and the financial resources essential to the implementation of an organization's environmental policies and the achievement of its objectives. In allocating resources, organizations can develop procedures to track the benefits as well as the costs of their environmental activities.

CLAUSE 4.4.2 – *Competence, Training and Awareness*
Competence of personnel should be judged on the basis of appropriate education, training and/or experience. Clause A.4.2 of ISO 14001:***2004*** states that the organization should also require that contractors working on its behalf are able to demonstrate that their employees have the requisite training, knowledge and skills to perform the work in an "environmentally responsible manner". Relevant training should take place at all levels within the organization. At senior management level, training should focus on raising the awareness of the strategic importance of environmental management in order to gain top-level commitment to the organization's policies. The competitive advantages of good environmental practices should be stressed.
Employees with very specific environmental responsibilities should receive skill enhancement training to improve performance at an operations level. Employees whose actions can affect compliance should receive training to ensure that regulatory and internal requirements are met.

CLAUSE 4.4.3 – Communication
Organizations should implement a procedure for receiving, documenting and responding to relevant information and requests from interested parties. This procedure may include a dialogue with interested parties and consideration of their relevant concerns. In some circumstances responses to interested parties' concerns may include relevant information about the environmental impacts associated with the organization's operations. These procedures should also address necessary communications with public authorities regarding emergency planning and other relevant issues.

Communication is important to demonstrate management commitment to the environment and to deal with concerns and questions about the environmental issues of the organization's activities, products or services. Results from EMS monitoring should also be communicated to those people within the organization who are responsible for performance.

Evidence of internal and external communication may be found in the company annual report, newsletters, bulletin boards, media campaigns, staff training programmes and paid advertising.

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CLAUSES 4.4.4 & 4.4.5 – Documentation and Document Control
It is essential that all documentation is legible and readily identifiable, maintained in an orderly manner and retained for a specified period. Obsolete documents may have to be retained for legal purposes or to provide historical records of the performance of the EMS.

The level of detail of the documentation should be sufficient to describe the core elements of the environmental management system and their interaction, and provide direction on where to obtain more detailed information on the operation of specific parts of the environmental management system. This documentation may be integrated with documentation of other systems implemented by the organization. It does not have to be in the form of a single manual. ***These requirements are now very similar to those in ISO 9001:2000.***

CLAUSE 4.4.6 – Operational Control
Implementation is accomplished through the establishment and maintenance of operational procedures and controls to ensure that the organization's environmental policy, objectives and targets can be met.

The organization should consider the different operations and activities contributing to its significant environmental impacts when developing or modifying operational controls and procedures. This could include, for example, contractors working on site whose operations give rise to significant impacts.

Regulatory requirements contained in documents such as authorisations and permits will stipulate operating criteria.
Activities can be divided into three categories:

- Activities to prevent pollution and conserve resources in new capital projects, process changes and resources management, property (acquisitions, divestitures, and property management), and new products and packaging.
- Daily management activities to assure conformance to internal and external organizational requirements, and to ensure their efficiency and effectiveness.
- Strategic management activities to anticipate and respond to changing environmental requirements.

CLAUSE 4.4.7 – Emergency Preparedness
Emergency plans and procedures should be established to ensure that there will be an appropriate response to unexpected or accidental incidents. The organization should define and maintain procedures for dealing with environmental incidents and potential emergency situations. The operating procedures and controls should include, where appropriate, consideration of:

- Accidental emissions to atmosphere.
- Accidental discharges to water and land.
- Specific environment and ecosystem effects from accidental releases.

The procedures should take into account incidents arising, or likely to arise, as consequences of: Abnormal operating conditions and accidents and potential emergency situations.

Annex A.4.7 of ISO/FDIS 14001:2004 now provides a useful list of considerations for emergency preparedness.

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CLAUSE 4.5.1 – Monitoring and Measurement
In order to determine if the organization is achieving its aims and objectives it is important that some monitoring activities are carried out. This will also aid identification of improvement opportunities as well as problems.

Some issues to be considered in measuring and monitoring:

- How is environmental performance regularly monitored?
- How have specific environmental performance indicators been established which relate to the organization's objectives and targets and what are they?
- What control processes are in place to regularly calibrate and sample monitoring equipment and systems?

CLAUSE 4.5.2 – Evaluation of compliance

- ***Although not a new requirement over the 1996 version this has now been given a clause in its own right to promote the significance of this requirement, especially in light of the policy commitment to comply with relevant environmental legislation.***
- ***What is the process to periodically evaluate compliance with relevant legal and other requirements? This could include the use of internal audits and management review to assess how well the organisation is doing. The mechanism should ensure that all areas of the relevant permit/authorisation are considered not just those requiring measurements to be taken e.g. operational control and documentation requirements***

CLAUSE 4.5.3 – Non-Conformity, Corrective Action and Preventive Action
In establishing and maintaining procedures for investigating and correcting non-conformance, the organization should include these basic elements:

- Identifying the cause of the non-conformance.
- Identifying and implementing the necessary corrective action.
- Implementing or modifying controls necessary to avoid repetition of the non-conformance. ***Also there is a need to take preventive action to address potential nonconformities to prevent their occurrence.***
- Recording the results of corrective and preventive actions taken and make any necessary changes to the Environmental management System documentation resulting from the corrective and preventive action.

CLAUSE 4.5.4 – Records
Procedures for identification, maintenance and disposition of records should focus on those records needed for the implementation and operation of the environmental management system, and for recording the extent to which planned objectives and targets have been met. Proper account should be taken of confidential business information. A complex range of information can result. The effective management of these records is essential to the successful implementation of the EMS. The key features of good environmental information management include means of identification, collection, indexing, filing, storage, maintenance, retrieval, retention and disposal of pertinent EMS documentation and records.

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Clause A.5.4 of ISO/FDIS14001: 2004 gives further guidance on types of records that could be covered by this requirement.

CLAUSE 4.5.5 – EMS Audits

The audit programme and procedures should cover:

- The activities and areas to be considered in audits.
- The frequency of audits.
- The responsibilities associated with managing and conducting audits.
- The communication of audit results.
- Auditor competence.
- How audits will be conducted.

Personnel conducting the audit should be in a position to do so impartially and objectively and should be properly trained.

The frequency of audits should be guided by the nature of the operation in terms of its environmental aspects and potential impacts. Also, the results of previous audits should be considered in determining frequency. The EMS audit report should be submitted in accordance with the audit plan.

Consideration should be given to the guidance given on EMS audits in ISO 19011:2002.

CLAUSE 4.6 – Management Reviews

Reviews need to be carried out at planned intervals to determine if the system remains effective and is suitable for the needs of the organization.

The 2004 standard now sets out the input requirements for the review:

- results of EMS audits
- communication from external interested parties
- environmental performance of the organization
- the extent to which objectives and targets have been met
- status of corrective and preventive actions
- follow up actions from previous management reviews
- changing circumstances such as:
    - changing legislation;
    - changing expectations and requirements of interested parties;
    - changes in the products or activities of the organization;
    - advances in science and technology;
    - lessons learned from environmental incidents;
    - market preferences;
- recommendations for improvement

The review should look at the suitability, adequacy and effectiveness of the EMS in relation to changing conditions and information.

Decisions and actions related to possible changes to the environmental policy, objectives, targets and other elements of the environmental management system should be documented for necessary action.

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Continual Improvement
ISO/FDIS 14001:2004 uses a modified Plan, Do, Check and Act Cycle in order to achieve continual improvements in overall environmental performance.

Depending on the situation this may be accomplished rapidly and with a minimum of formal planning, or it may be a more complex and long-term activity. The associated documentation should be appropriate to the level of corrective action.

The findings, conclusions, and recommendations reached as a result of monitoring, audits and other reviews of the environmental management system should be documented, and the necessary corrective and preventive actions identified. Management should ensure that these corrective and preventive actions have been implemented, and that there is systematic follow-up to ensure their effectiveness.

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Chapter 5
Aspects and Impacts

Environmental impacts (positive or negative) arise from consumption of natural resources and emissions to air, water or land. Environmental impacts will arise at all stages of the lifecycle of a product or indeed service. An organization may have differing levels of control over impacts at different lifecycle stages.

An environmental aspect is an "element of an organization's activities, products or services that can interact with the environment. "(Clause 3.6 ISO 14001).

An environmental impact is "any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or processes (Clause 3.7 ISO 14001)."

For example, a painting process (the activity) may result in the emission of volatile organic compounds (the environmental aspect). These emissions contribute to poor local air quality and depletion of the ozone layer (the environmental impacts).

The range of environmental aspects from any organization is so wide that the organization needs to decide the boundary of its EMS. ISO 14001 requires an organization to consider those aspects "*that it can control and over which it can be expected to have an influence*". This affects, for example, the role and performance of suppliers and subcontractors.

In defining boundaries it should be remembered that the reason for an EMS is to bring benefit to the business, so it should be remembered what the EMS is for. This will depend on the nature and business strategy of the organization.

The boundary of control is likely to be in areas of process control and legal compliance issues.

The boundary of influence is likely to be over external organizations such as suppliers and contractors (e.g. regarding their own environmental policies and practices), and indeed over customers (e.g. regarding disposal of product at end of useful life etc.) or peer group (e.g. sharing best practice for the benefit of the sector as a whole.)

Almost all impacts can be categorised according to the above. This can serve as a useful checklist when determining environmental impacts.

It is important for auditors to have a good understanding of environmental aspects and impacts, in order to assess the implementation and effectiveness of the procedures to evaluate significant impacts.

Significant impacts are central to the design and scope of the EMS. The EMS is after all intended to manage those significant impacts. Relevant significant impacts need to be considered throughout the design, implementation and maintenance of the EMS, e.g. in the policy, the objectives and targets, and the training needs of personnel.

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Product lifecycle audit is a useful framework for identifying environmental impacts. Environmental impacts may be very different in nature and scale at different stages of the lifecycle. The organization may or may not have control of influence of the environmental impacts at the various lifecycle stages.

The approach to identifying and evaluating environmental impacts needs to be systematic and "transparent". Activities, products and services need to be defined; normal, abnormal and emergency operating conditions need to be considered; environmental aspects need to be characterised and quantified; the associated environmental impacts be evaluated; and finally significant impacts be determined. The process to determine significant impacts is not intended to require a full lifecycle audit.

Determining significance of environmental impacts is sometimes controversial. Both business concerns and environmental concerns must be considered. For business concerns it should be remembered that the reason for an EMS is to bring benefit to the business, whether through security of compliance with legislation, through cost reduction or through managing stakeholder demands and expectations.

Environmental concerns must also be taken into account in terms of scientific evidence of a problem and the overall contribution of the organization to that problem. Most areas of proven environmental impact are often regulated. New or proposed projects also need to be included in the scope of the EMS, and therefore within the procedure for identifying and evaluating environmental impacts.

Environmental Impacts Audit methodologies usually look at design, construction, commissioning, operation, materials used, decommissioning, and after use of land. There are many different ways of identifying significance of impacts, ranging from simple subjective rating systems to sophisticated risk audit techniques. Risk audit techniques developed in other areas such as FMEA (Failure Modes Effect Analysis), hazard and operability (HAZOP) can be used for environmental impacts.

Although there is no right or wrong way, the methods used by the organization should be appropriate to the nature and scale of the operation, the level of environmental risk involved and the significance of the impacts identified.

For risk audit purposes, emission scenarios can be categorised into three types:

- continuous by design, e.g. process effluent discharge, boiler emissions;
- continuous by failure, e.g. fugitive emissions and leaks;
- acute discharge events, e.g. an accident or acute incident.

The likelihood of environmental impacts and hazards arising from these scenarios also needs to be identified. Process management records such as design reviews, HAZOP studies, and reliability studies may be used to determine likelihood of occurrence. Pollutant analysis records such as epidemiological studies for pollutants, toxicology studies and pollutant modelling studies may be used to determine likely environmental impacts. As scientific evidence as well as public perception is continually changing, criteria used to evaluate significance will also be continually changing.

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Chapter 6
Legislation – An Overview
(to be read in conjunction with the Regulatory Summary Book)

At least part of the reason for having an EMS is to ensure compliance with legislation. Knowledge of the law is therefore essential to assess the effectiveness of the system.

Auditors need to understand legislation in depth. It is likely therefore that auditors will develop specialities for a sector or type of operation and for individual countries.

Legislation and regulations provide a set of rules to which the organization must comply. These rules may take the form of authorisations, permits or consents.

However, legislation is also dynamic and frequently updated so auditors need a mechanism to keep up to date with changes.

It is the Lead Auditor's responsibility to ensure that the audit team includes competence in environmental legislation. Legislation is central to many parts of the EMS.

- the policy, which must contain a commitment to complying with legislation
- the procedure to identify legal and other requirements – it is likely that a record of legal requirements be kept
- the procedure to evaluate significance of environmental effects – legal requirements will strongly indicate significance
- the objectives and targets – which are set in the areas of significant effect the management programme which delivers the objectives and targets

The need for knowledge of legal issues is a key area where environmental auditing differs from quality system auditing, where there is no equivalent requirement.

Structure of Policy and Law
Most of environmental legislation is driven by the European Union. Key European legislation:

- Regulations which are implemented directly, i.e. binding as written.
- Directives which are implemented indirectly through national laws.
- Decisions which refer to individual companies or Member States and are used to bind the EU to international environmental agreements.
- Recommendations which provide advice and are not binding.

Implemented in Member States by national laws:

- UK legislation made up of primary legislation (Acts of Parliament), specific parts of which are implemented by secondary legislation (e.g. Statutory Instruments).

Areas subject to regulation are usually determined to be significant. External audit reports will indicate company specific priorities. Concerns of stakeholders and the public are usually taken up by local community groups or environmental pressure groups.

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Environmental law is continually under development. Auditors need to keep up to date, as they need to assess the implementation and effectiveness of procedure to track developments.

European legislation is also constantly under development. European legislation is often indicative of what will be brought in under UK legislation in the near future.

The key regulatory bodies are:

- Environment Agency (IPC, water discharges to controlled waters and water abstraction
- Local Authorities (air pollution control, noise, town planning, statutory nuisance)
- Water companies (water discharges to sewers)
- English Nature (nature conservation)

Auditors need to keep abreast of legislation. There are increasing numbers of journals, magazines and advisory agencies that can be used to keep implementers and auditors up to date. These can include Croners, Barbours, ENDS, NSCA pollution Handbook, Trade Associations.

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Chapter 7
Some References and Sources of Further Information

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Eco Management and Audit Scheme
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EMAS Help Desk
www.europa.eu.int/comm/environment/emas/oindek.htm

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