



IEMA Foundation Certificate in Environmental Management

ELEMENT 4: ENVIRONMENTAL MANAGEMENT SYSTEMS

SAMPLE MATERIAL

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The Benefits of Implementing an EMS

There are many benefits that can accrue from developing an effective EMS, such as:

- **Increased Profits**

Good environmental management can result in increased profits. From reducing waste and energy costs, to identifying production inefficiencies and payment of less environmental taxes, e.g. Climate Change Levy.

- **Workforce**

An EMS will help improve both commitment and morale of the workforce.

- **Customers**

Developing an EMS may be the result of customer pressure and will help an organisation sell products and service to an international market.

- **Shareholders**

Publicising good environmental practices could be used to increase the value of shares in a company and vice versa.

- **Local Community**

An externally certified EMS can demonstrate an organisations commitment to good environmental practices to the local community.

- **Insurers and Lenders**

An organisation may receive better rates if it has an externally certified EMS as it will be seen as being lesser risk.

- **Regulators**

Regulators such as the Environmental Agency may be more lenient to those businesses that have a recognised system of environmental management.

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Element 4: Environmental Management Systems

The ISO 14000 Series of Environmental Standards

ISO 14001 is one standard in a series produced by the ISO. The others are identified in the table below.

Standard	Title
ISO 14004:2004	Environmental Management Systems - General Guidelines on Principles, Systems and Support Techniques.
ISO 14015:2001	Environmental Management - Environmental Assessment of Sites and Organisations (EASO)
ISO 14020:2000	Environmental Labels and Declarations - General Principles
ISO 14021:1999	Environmental Labels and Declarations - Self-Declared Environmental Claims (Type II Environmental Labelling)
ISO 14024:1999	Environmental Labels and Declarations - Type I Environmental Labelling – Principles and Procedures
ISO 14031:1999	Environmental Management - Environmental Performance Evaluation - Guidelines
ISO 14040:2006	Environmental Management - Life Cycle Assessment - Principles and Framework
ISO 14044:2006	Environmental Management - Life Cycle Assessment - Requirements and Guidelines
ISO 14050:2009	Environmental Management - Vocabulary

Examples of Other Standards in the ISO 14000 Series

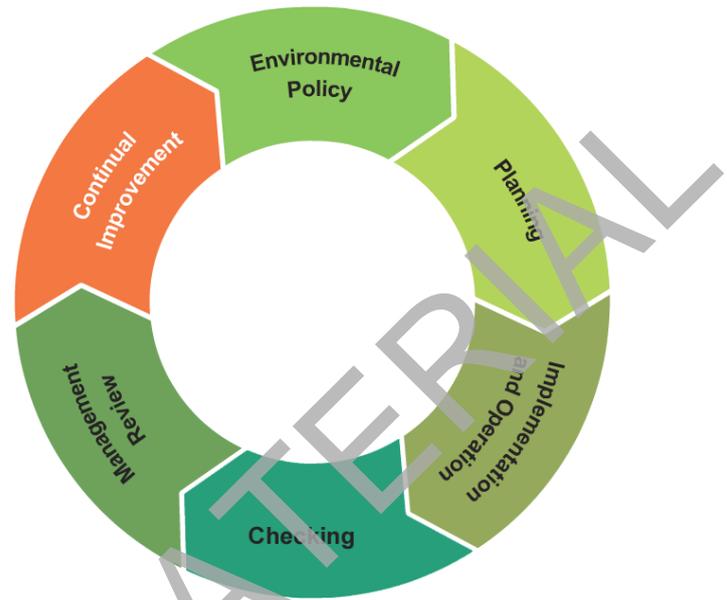
The standard ISO 19011:2002 “Guidelines for quality and/or environmental management systems auditing”, is not within the 14000 series of ISO standards but does cover requirements for EMSs in addition to quality management system auditing.

Key Elements of ISO 14001

ISO 14001 works on the PDCA model, which we briefly considered earlier, but is specific to environmental management. It is a process of continual improvement and has five key components:

1. Environmental policy.
2. Planning.
3. Implementation and operation.
4. Checking.
5. Management review.

These can be seen in the following figure.



Structure of ISO 14001:2004

In this part of the course we will consider the key components of ISO 14001. Rather than considering each element in the order they are stated in the standard, we will consider them in the order in which they should be developed.



More...

www.iema.net/ems/homeuk/

Planning and Policy

Environmental Aspects and Impacts

Following compilation of an environmental review, the organisation should be in a situation where it can identify its significant aspects and impacts. A procedure must be produced on how aspects and impacts are identified, evaluated, recorded and reviewed. An output of this part of the EMS will be the aspects register.

Environmental Policy

Following identification of significant aspects, the organisation should be in a position to develop an environmental policy statement.

The purpose of a policy is to identify the organisation’s aims and principles with regards to environmental management. It also acts as a framework for the setting of objectives, targets and management programmes, as we will see later. The policy can only be developed following the identification of the significant aspects and



impacts as it should be in part based on improvements to these. Senior management commitment must be gained by the most senior person in the organisation signing the policy.

ISO 14001 provides information on the content of the policy in the form of six key principles. The policy should:

- Be **appropriate** to the nature, scale and environmental impacts of its activities, products or services - a policy should be based on the significant impacts of the organisation.
- Include a commitment to **continual improvement** and **prevention of pollution** - these commitments must be clearly and explicitly stated in the policy.
- Include a commitment to comply with relevant **environmental legislation**, and **other requirements** that are applicable to the organisation - this is an important commitment and must be clearly identified in the policy. 'Other requirements' includes requirements such as those stated in Codes of Practice, standards and corporate requirements which the organisation follows.
- Provide the framework for setting and reviewing environmental **objectives and targets** – the policy should provide general high level aims on how the organisation is to improve, these are backed up with more detailed objectives and targets.
- Be **documented, implemented, maintained** and **communicated** - the policy must be written, should not identify commitments that will not be implemented, and must be communicated to all employees (e.g. notice boards, intranet, etc.).
- Be available to the **public** - for example by placing a copy of the policy on the organisation's website.

An environmental policy statement is usually about a page in length and is an important and prominent internal and external feature of the EMS.

Objectives and Targets

To ensure that commitments stated in the policy are met, ISO 14001 requires the development of objectives and targets. Objectives and targets shift the approach of the EMS from identifying problem areas to actually doing something about them. They also assist organisations in complying with their commitment to continual improvement.

Jargon Buster

Objectives

Objectives identify broad areas of improvement and are not usually quantified.

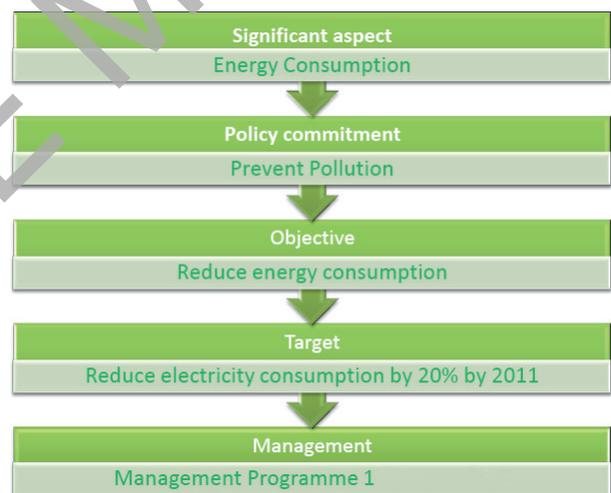
Jargon Buster

Targets

Targets should be linked to an objective. They identify in a much more detailed way what must be done. Typically targets are **SMART**:

- **Specific.**
- **Measurable.**
- **Achievable.**
- **Realistic.**
- **Time bound.**

Ideally, every policy commitment should be backed up by at least a single objective, target or management programme that commits organisations to improve with set timescales.



ISO 14001 Policy Links

ISO 14001 identifies that objectives and targets should be based on the following criteria:

- Legal and other requirements.
- Significant aspects.
- Technological options.
- Financial, operational and business requirements.
- Views of interested parties.

Although often addressing significant aspects, they are not limited to these and may consider other issues for business or financial reasons.

Management programmes are, in essence, action plans that are linked to policy commitments, objectives and targets. (See the Appendix to this element for an example of a Management Programme.)



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As a minimum they should consist of:

- **Tasks** – actions to be completed to meet a target.
- **Timescale** – when a task will be completed by.
- **Responsibility** – who will be responsible for ensuring that the task is completed within the timescale specified.

Some organisations develop **environmental performance indicators** (a form of key performance indicator) that measure reductions in significant environmental impacts.

Legislation

ISO 14001 requires that organisations develop and maintain procedures to identify and have access to all relevant environmental legal and other requirements.

Issues to be considered in this procedure are:

- How does the organisation access and identify relevant legal and other requirements?
- How does the organisation keep track of legal and other requirements?
- How does the organisation keep track of changes to these requirements?
- How does the organisation communicate relevant information on legal and other requirements to its employees?

It is implied in ISO 14001 that the output of the legal procedures is a legal register. This should identify the relevant law and other requirements and in what way they are applicable to the organisation. Environmental law changes regularly, so the register must be kept up to date.

It is essential that relevant employees are aware of their legal duties and the legal procedure should identify the process by which employees can gain access to information on environmental legal requirements relevant to their jobs.

Implementation and Operation

Resources, Roles, Responsibility and Authority

Roles and responsibilities must be identified and documented in order to comply with ISO 14001. All employees must be made aware of their responsibilities for complying with the policy and other relevant requirements. Responsibilities can be documented in numerous ways and are often identified in job descriptions and/or in the environmental manual.

ISO 14001 states that roles, responsibilities and authorities should be defined documented and communicated in order for correct working of the EMS.

Roles and responsibilities will be different within

organisations, but a list of common responsibilities is provided in the following table:

Example Environmental Responsibilities	Responsibility
Identify overall direction of the EMS.	Chief Executive/ Managing Director.
Design policy.	Chief Executive/ Managing Director/ Environmental Manager.
Identify environmental objectives, targets and programmes.	Departmental Managers.
Monitor EMS performance.	Environmental Manager.
Identify training needs/ Retain training records.	Environmental Manager/ Human Resources Manager.
Track cost associated with the EMS.	Finance.
Identify customer requirements.	Sales and marketing staff.
Compliance with procedures.	All staff.
Undertaking audits.	Audit team.

Sample Environmental Responsibilities.

By determining the important environmental issues within an organisation, it is possible to work out the required roles and responsibilities to ensure appropriate control. Key areas that responsibilities should be considered for are:

- Environmental management programmes.
- Legislative requirements.
- Control of significant environmental impacts.
- Current responsibilities for environmental management or other management systems, (e.g. quality).

The next stage is to identify roles and responsibilities for each issue, common approaches include development of:

- Responsibility matrix.
- Organisational chart.
- Written job roles.

ISO 14001 also requires that a management representative is appointed. The management representative has responsibility for:

- Ensuring that the EMS is developed, implemented and maintained to ISO 14001.



- Reporting how successful the standard is to top management and highlighting where amendments and improvements will be required.

The responsibilities section of ISO 14001 also requires that organisations provides resources for effective implementation and maintenance of the system. Resources can include human resources (e.g. auditors, engineers, etc.) or material resources (e.g. abatement equipment, training, etc.).

Competence, Training and Awareness

Any person performing tasks, for or on behalf of the organisation, that could have a significant environmental impact must be competent. This applies not only to employees but the organisation must also ensure that contractors and their employees are able to demonstrate their competency.

The organisation must therefore undertake a competency assessment to ensure appropriate education, training or experience leads to the competency and capability of individuals such that there is effective control of the organisations significant impacts.

A common way of determining competency and development needs would be to develop a matrix for identifying relevant employees, their environmental responsibilities and current training, experience and education for each significant aspect.

Such a system may be in place already for general training needs and can be used with minor alteration for the EMS.



Training

Training is an integral part of competency and the standard requires that three levels of training should be identified:

- **Environmental awareness** - to create an appreciation and basic understanding of environmental issues amongst all employees.
- **Specialised skills/knowledge** - individual activity based training need for personnel involved with environmentally significant processes or activities.
- **EMS training** - this training requires that individuals within an organisation have the skills to maintain and implement an EMS (i.e. capable of writing policies and understanding legal requirements, etc.).

Communication

Communication on environmental matters, to both internal and external parties, is important for the successful running of an EMS. It is important for a number of reasons, including:

- Workforce motivation.
- Explanation of the environmental policy – both internally and externally. (It is a requirement that it is both internally and externally communicated.)
- Ensuring staff know their roles and responsibilities.
- Demonstrating management commitment.
- Monitoring and measuring environmental performance
- Identifying improvements to the EMS.

The ISO 14001 standard requires that two types of communication should be considered:

- **Internal** communications - between the various levels and functions of the organisation; and
- **External** communications - receiving, documenting and responding to relevant communication from external interested parties.

The organisation is also required to make a decision as to whether it would like to externally communicate its significant impact.

It is essential that the following components of an EMS are communicated:

- The Environmental Management System.
- The importance of compliance with the environmental policy, procedures and system.
- The consequences of non-conformances (either potential or actual).
- Roles and responsibilities of staff members.
- The significant environmental aspects associated with work activities and the environmental benefits of improved personal performance.

External communications require systems for the flow of information from both bottom up and top down. Employees should not be forgotten as they usually have a in-depth understanding of the job and can be an important sources of ideas and improvements.

External communication may include complaints from the local community or investigations by regulators. ISO 14001 requires that an organisation has a procedure present to deal with such communications, ensuring



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that they are directed to the correct person, recorded and dealt with. It is common for ISO 14001 certified organisations to have a communications log which acts as a means of recording and tracking external communications.

Documentation and Control of Documents

ISO 14001 requires that a range of documents are established and maintained. These include:

- **Policy** - a general statement of intent.
- **Manual** - provides a general description of the EMS, including links to more detailed parts of the EMS such as procedures and records.
- **Procedures** - an in depth description of how aspects of the EMS operate. They can be categorised into two areas:
 - Systems procedures - required for effective running of the system, e.g. document control, legal procedures, etc.
 - Operational procedures - controlling significant aspects.
- **Records** - these provide very detailed information of the EMS and are usually outputs of procedures. Examples include aspects and impact registers, training records and waste transfer notes.

Documents must also be controlled. They should be:

- Located in a efficient manner.
- Legible.
- Reviewed on a regular basis and amended as is necessary.
- Available - current version of the documents are available in the area where they are needed.
- Archived - documents that have become obsolete are kept (this may be required for legal purposes, e.g. waste transfer notes must be kept for two years).

A document control procedure must be developed to ensure that documents are effectively controlled with regards to the requirements stated above.

Operational Control

Certain operations must be controlled within the EMS to ensure that objectives and targets are achieved and the policy is complied with. For identified significant aspects, a common approach is to have at least one documented operational control procedure per significant aspect. Procedural control can also have other uses within the EMS, for example they can act as training aids and help ensure compliance with legal requirements.

Identifying operations that need control is essential for the effective operation of an EMS. Common activities which require operational controls include:

- Contractor management.
- Emergency situations (e.g. floods, fires, etc.).
- Waste management.
- Operation of a wastewater treatment plant.
- Maintenance activities.

When working out the content of an operational control procedure to be included within the EMS, consideration should be given to the following:

- What parameters need control?
- How can these be controlled to decrease environmental impact?
- Are there any checks, measurements or tests that would sufficiently increase control?

Significant aspects should be controlled. Activities that cause these aspects should be identified and the type of control needed should be determined from the need to manage or reduce such impacts. It is important to develop a draft procedure which should be trialled and altered, as appropriate, before the final version is issued.

When implementing an EMS for the first time, a preliminary review is usually undertaken to determine current performance. This review is useful in the identification of the need for operational controls and, whilst it is not a mandatory part of ISO 14001, in practice it is essential.

Emergency Preparedness and Response

ISO 14001 states that organisations must establish and maintain procedures to identify and respond to accidents and emergency situations and to prevent or reduce environmental impacts that occur from them. Such procedures must be reviewed and revised at relevant times, such as following an emergency situation. Such procedures should be tested where appropriate.

Common accidents that have an environmental impact include fires, floods, waste water releases and air releases.



Fire

It is important to ensure that incidents arising from, or potentially arising from, abnormal operating conditions and accidents and potential emergency conditions are taken in to consideration.



The types and number of procedures required depends on the nature of the organisation. For example, a large chemical company would normally require a complex emergency plan, whereas a standard warehouse would require a few basic emergency procedures.

The procedures should state how staff respond during the emergency or abnormal condition and identify prevention and mitigation measures to ensure that the environmental impacts of the event are eliminated or minimised.

Checking

Monitoring and Measurement

Monitoring and measurements must be undertaken for the successful operation of an EMS. The ISO 14001 standard states that procedures should be developed and implemented that cover the monitoring of key operational characteristics that can have a significant environmental impact. Such procedures should cover:

- Information to measure performance.
- Operational controls.
- Conformity with objectives and targets.

As with other parts of ISO 14001, how monitoring is undertaken is up to the organisation. One method of monitoring environmental performance, associated with significant aspects, is monitoring the requirements that are stated in environmental management programmes. The monitoring of conformance to objectives and targets and operational controls can be achieved through the internal audit process.

The results of monitoring should be evaluated to identify areas of success and identification of activities that require control. For example, if a target is to reduce water consumption by 20% then some objective means to work out water consumption on a frequent basis is required, e.g. m³ of water consumed.

Control systems should be put in to place to ensure the reliability of data such as the calibration and maintenance of instruments.



Auditor Monitoring Conformity with Objectives

Evaluation of Compliance

An organisation must develop and implement a procedure for evaluating compliance with legal and other requirements. The standard also states that a record of these evaluations should be retained. This is achieved by most organisations through the undertaking of audits and, when implementing an EMS for the first time, through the preliminary review.

Changing circumstances will require a re-evaluation and this process is therefore not a 'one off' activity

EMS Records

ISO 14001 requires that procedures are present for the identification, maintenance and disposal of records. Records include the following:

- Waste transfer and consignment notes.
- Training records.
- Aspects and impacts register.
- Legal register.
- Results of monitoring.
- Hazardous material spill/other incident reports.
- Results of management reviews.
- Sampling and monitoring data.
- Maintenance records.
- Equipment calibration records.

The records that are needed should be clearly identified within the EMS. They should be provided with a reference number, date and issue number. The retention time of the record should also be documented. This information is commonly recorded in a record log.

If an organisation operates a quality management system to ISO 9001 then a procedure covering these requirements should already be in place.

EMS Auditing

We've already discussed the definition of an environmental audit within ISO 14001. The standard also identifies what the ISO 14001 audit programmes and procedures should cover, including:

- 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 are to be conducted.



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The purposes of an EMS audit can be numerous. Generally, it could be said that an EMS audit aims to determine whether the EMS is in compliance with ISO 14001, legal issues and procedures (or a combination of these issues). Audits must also verify that an EMS is effectively implemented and maintained. The internal audit plays a vital role within the EMS and therefore is an important component that is evaluated by certification bodies. Environmental audits should be part of management control and good management practice.

Term	Meaning
Audit procedures	Describes the audit methodology and reporting.
Audit schedule	<p>Annual programme of audits. ISO 14001 requires that your organisation develops an environmental audit schedule that is based around the audit frequency stated in the environmental audit procedure.</p> <p>The audit schedule will be used to identify the frequency and location of internal environmental management system audits and will be revised as necessary.</p> <p>Revisions to the audit schedule may be based on the results of prior audits and should take into account the environmental significance of an organisation's activities and issues.</p> <p>The audit schedule can be based on individual departments or ISO 14001 clauses.</p>
Audit cycle	Period over which all parts of the organisation are audited.
Audit plan	Sets out timetable and plan for individual audit.

EMS Audit Terminology

It is essential that a competent EMS auditor checks for the intent of an organisation regarding their EMS, e.g. does the manual or policy comply with the standard? The implementation of the system must be ensured, by checking procedures are fully implemented. The effectiveness of the system should also be ensured, such that the system achieves continuous improvement.

Corrective and Preventative Action

An EMS developed to ISO 14001 must also consist of procedures for dealing with non-conformances (usually identified through auditing, although they can be identified during activities such as monitoring or environmental committee meetings).

This includes a system for both corrective and preventative actions. More specifically, the standard states that such procedures should:

- Identify and correct non-conformances and undertake actions that mitigate environmental impacts.
- Investigate non-conformances (identifying causes and taking action to prevent them from occurring).
- Evaluate the need for action to prevent non-conformances and implement actions.
- Record any corrective or preventative actions undertaken.
- Undertake reviews of corrective and preventative actions.

Corrective and preventative actions are often identified during the audit process.

Management Review

Top management should review the EMS to evaluate whether it is suitable, adequate and effective and the review should be completed at frequent intervals. The purpose of the review is to assess the need for EMS improvements.

Management reviews usually (although do not have to) consist of a meeting where the environmental manager, or equivalent, will give a presentation on the status of the EMS.

ISO 14001 states that the following should be discussed during the management review:

- Results of audits.
- External communications, e.g. complaints.
- The environmental performance of the organisation.
- The level of compliance with objectives and targets.
- Status of corrective actions.
- Past management review actions.
- Changing circumstances, e.g. changes of law.
- General recommendation to improve.

No review frequency is identified in ISO 14001, however most organisations undertake a management review once a year and it may form part of a general management meeting. An agenda and review minutes should be documented and retained.



Integrated Management Systems

ISO 9001, ISO 14001 and OSHAS 18001, etc. are management system standards that have been developed to deal with quality, environmental and health and safety issues respectively. Commonly, management systems are integrated by combining an environmental management system (EMS) or an occupational health and safety management system, and sometimes a quality management system into a single system.

To ensure that environmental issues and concerns are effectively managed, the EMS elements should be designed or revised so that they are effectively integrated with existing management system elements.

Management system elements that are often integrated include:

- Organisation policies.
- Resource allocation.
- Operational controls and documentation.
- Information and support systems.
- Training and development.
- Organisation and accountability structure.
- Reward and appraisal systems.
- Measuring and monitoring systems.
- Communication and reporting.

ISO 14001 is based on the PDCA model. Many organisations choose to use an existing management system consistent with the ISO 9000 series as a basis for an EMS. If environmental elements can be clearly identified for auditing purposes, this approach is likely to avoid unnecessary duplication of management system elements.

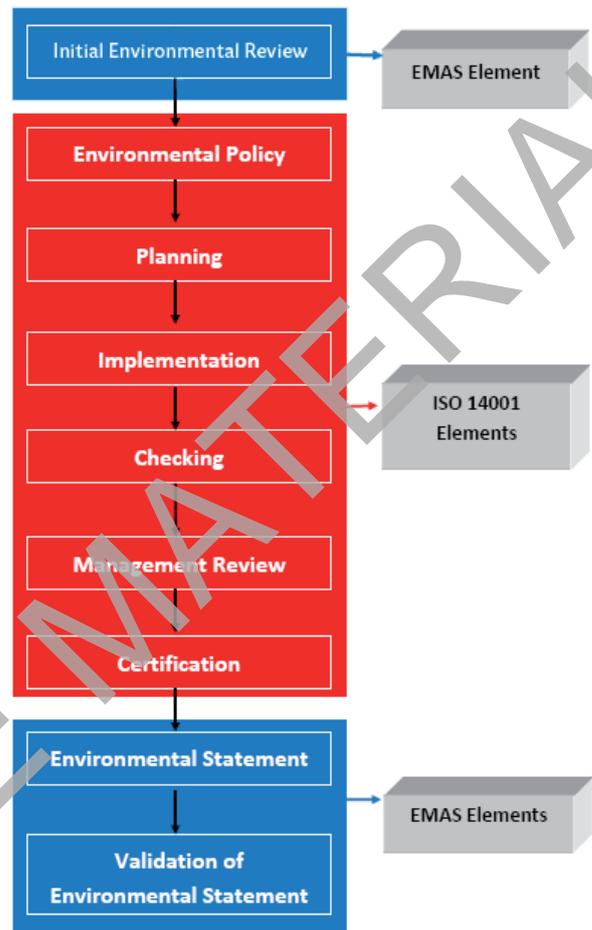
Eco-Management and Audit Scheme

The Eco-Management and Audit Scheme (EMAS) is another environmental management system. It is a European regulation which allows companies within the EU to establish an alternative environmental management system. EMAS and ISO 14001 share a lot of similarities. However, EMAS is considered as a more robust management system standard and has extra requirements to those stated in ISO 14001.

More...

http://c.europa.eu/environment/emas/index_en.htm

As the following diagram shows, the two standards are broadly compatible, with the EMS part of EMAS being similar to the full ISO 14001 standard.



Links between ISO 14001 and EMAS

There are a number of differences between the two standards. For example:

- ISO 14001 is an international standard whilst EMAS is a European standard.
- Initial environmental review is a mandatory requirement of EMAS but only recommended by ISO 14001.
- Under EMAS a publicly available environmental statement must be produced that has to be validated by an independent body (to ensure that it accurately describes the environmental performance of the organisation).
- ISO 14001 requires an organisation to respond to communications from external interested parties. An open dialogue must be established between the organisation and the public under EMAS.
- In ISO 14001 there is a commitment to comply with applicable legal requirements. An organisation that possesses EMAS must demonstrate that it complies with environmental law. Breaches of law may result in EMAS registration being withdrawn.



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- There is no explicit audit cycle identified in ISO 14001. The audit interval for EMAS is no greater than three years (during this time areas are required to be verified at least once).

Although not as popular as ISO 14001, there are still around 6,000 organisations in Europe who have developed management systems to the requirements of EMAS.

BS 8555

BS 8555 is a British standard that states a phased implementation approach, breaking down the process of designing and implementing an EMS into five phases. A sixth phase enables organisations to gain a recognised standard (ISO 14001 or EMAS). It offers an approach for small and medium sized organisations to gain an EMS without having to gain immediate certification to ISO 14001 or EMAS.

After the development and implementation of each phase the organisation can either assess itself through internal audits, allow customers to assess it against the appropriate phase criteria, or be assessed by a third party (e.g. certification body).

The six phases of the standard are:

1. Commitment and establishing the baseline.
2. Identifying and ensuring compliance with legal and other requirements.
3. Developing objectives, targets and programmes.
4. Implementation and operation of the environmental management system.
5. Checking, audit and review.
6. Environmental management system acknowledgment.

At Phase 6, meeting all the achievement criteria from the previous phases will place the organisation in a position to be assessed for certification to ISO 14001 or EMAS.

Note: You should be aware that the ISO 14005 standard offers a phased implementation approach to EMS implementation. The standard contains 71 steps to achieve ISO 14001:2004 certification. However, it has been criticised due to its complexity in comparison to BS 8555 and as such has been rejected by the European Standards Board (CEN).

ISO 9000 Quality Standards Series

The ISO 9000 series of international quality management standards was first published in 1987. The ISO 9000 series of standards has been adopted by more than 80 countries and is used as a benchmark for quality management by industry and government bodies

worldwide. In some cases, ISO 9001 registration has become a prerequisite for doing business domestically and internationally.

ISO 9001 follows a **process approach** that may be used to identify and manage numerous related activities by considering their inputs and outputs.

- **Identify the Processes of the Organisation**
Identifying purpose, policies, processes (and sequence) and owners (responsibilities, organisation).

- **Plan**
 - Defining activities within each process.
 - Determining monitoring and measurement requirements.
 - Determining what resources are needed.

- **Implementation and Measurement**
Implement the plan and measure or monitor as planned.

- **Analysis of Process**
Analyse and evaluate monitoring data - determine performance and need for improvement.

- **Corrective Action and Improvement of the Process**

There are many links between ISO 14001 and ISO 19001. These include:

- **Environmental policy** - the environmental policy, supported by objectives is important and similar in ISO 14001 to the requirements for a quality policy in ISO 9001.
- **Organisation and personnel** - ISO 14001 defines responsibilities, resources and structure. ISO 9001 also covers these issues.
- **Environmental aspects and impacts** - there are no similar requirements in the ISO 9001 standard.
- **Environmental objectives and targets** - objectives and targets provide a way of achieving strategic policy goals to achieve continual improvement. Organisations are required to develop quality objectives in ISO 9001.
- **Environmental manual and system documentation** - the document control requirements are very similar for both ISO 9001 and ISO 14001 standards.
- **Environmental records** - ISO 9001 and ISO 14001 both identify that records are required to demonstrate compliance with the respective systems.
- **Environmental management audits** - both standards have requirements for regular audits.
- **Management review** - required in both standards in order to maintain continual improvement.



- **Operational control** - there are a number of similar clauses in ISO 9001 that cover different aspects of the production process. Some of these have relevance to an EMS, such as calibration of instruments.

Total Quality Management

Total Quality Management (TQM) is a philosophy of management (rather than a standard) that has the objective of integrating all parts of an organisation to focus on meeting the needs of the customer and objectives of the organisation. The TQM approach was developed by Walter Shewhart and Edward Deming who helped Japan's economy to recover after the Second World War.

TQM is designed to empower the whole organisation to have responsibility for the quality of products and services. It places particular emphasis on:

- Defining processes and measuring performance.
- Reviewing performance to identify process shortcomings.
- Analysing process shortcomings to identify root causes of issues/problems (using detailed statistical methods).
- Devising and implementing permanent process change solutions (rather than short-term 'fire-fighting' solutions).

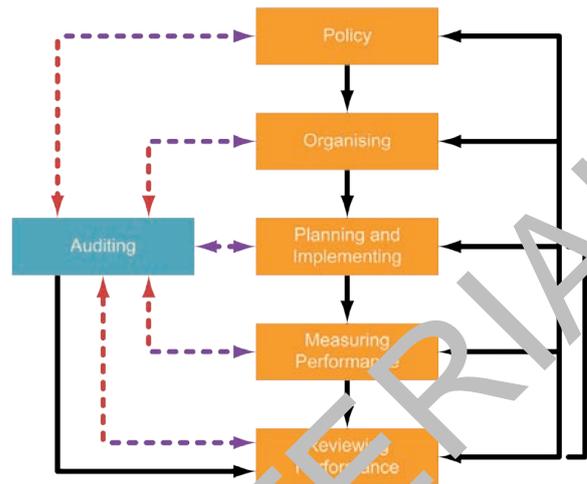
The PDCA model we considered earlier is an important TQM tool that aims to achieve continual improvement.

Health and Safety Management

There are various standards and guidance publications that have been designed to manage health and safety and these are commonly integrated with EMSs.

HSG 65

HSG 65 is a guidance document produced by the UK's Health and Safety Executive (HSE). As can be seen below, it has many similarities with ISO 14001.



*Elements of Successful Health and Safety Management
(Based on HSG65)*

OHSAS 18001

Occupational Health and Safety Assessment Series (OHSAS) 18001 is health and safety management system standard that has been developed to be close to the requirements of ISO 14001. It states that organisations identify existing health and safety activities, and design programmes and systems that focus on the elimination of risk to staff and others. Health and safety performance must be continuously improved. The elements of the system are (notice the similarities to ISO 14001):

- Occupational health and safety policy.
- Planning.
- Implementation and operation.
- Checking.
- Management review.



More...

<http://www.hse.gov.uk/PUBNS/books/hsg65.htm>