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## Environmental Management Systems

*An Environmental Management System (EMS) is a structured framework for managing an organisation's significant environmental impacts. Some organisations have adopted the framework specified in national or international standards, which set out the requirements of an EMS, and have had their systems externally assessed and certified against these, others have developed their EMS in a more informal way. Whatever approach has been adopted, the elements of the EMS framework will largely be the same.*

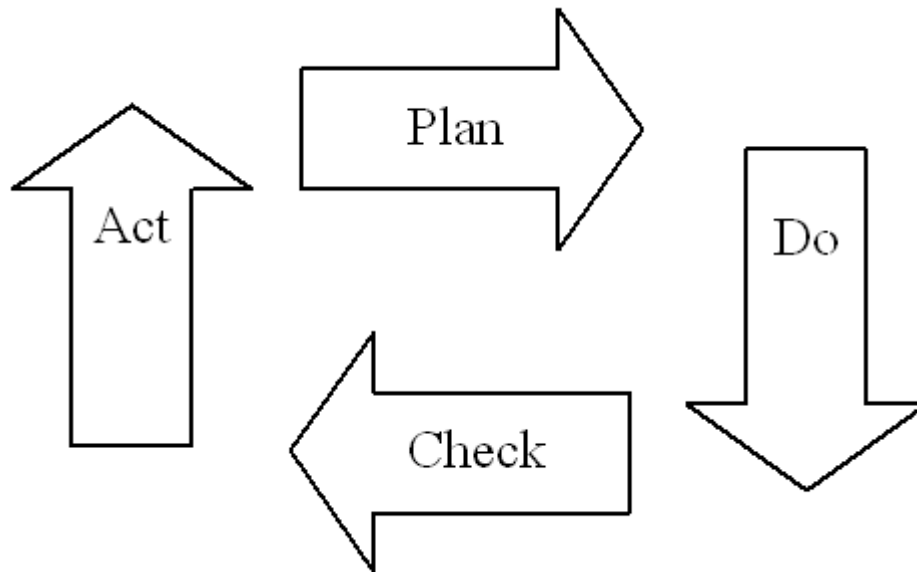
### EMS background

Most organisations adopt a systematic approach to the management of their day to day operations. Over the years, the different elements of such systems have become more defined, and standardised approaches have been developed to help organisations to manage certain functions, for example quality. In the early 1990's, work was initiated by the British Standards Institution (BSI) to develop an EMS specification, which was first published as BS 7750 (BSI, 1992). National EMS standards were also published in other countries, e.g. Spain and Ireland.

At around the same time, the European Commission was developing the Eco-Management and Audit Scheme (EMAS), which was similar to BS 7750 but included some additional requirements, for example public reporting of environmental performance. The requirements of EMAS were published as Council Regulation 1836/93 in 1993 (EC, 1993) and were revised in Council Regulation 761/2001 (EU, 2001). Following publication of BS 7750, the International Organisation for Standardisation (ISO) developed ISO 14001 '*Environmental Management Systems – specification and guidance for use*' (ISO, 1996). Its adoption as a European Standard by the European standardisation body (CEN) meant that, in Europe, all similar national standards were required to be withdrawn.

More recently, a new British Standard BS 8555 '*Environmental Management Systems – specification and guidance for use*' was published (BSI, 2003). It provides a staged way for organisations to implement an EMS and achieve accredited certification to ISO 14001 and registration to EMAS. It is primarily (but not exclusively) aimed at small and medium sized enterprises.

Although the development of different standards at the national, European and then international level was potentially confusing, all of the EMS standards followed the Denning Cycle of: plan what you're going to do, do what you planned to do, check to ensure that you did what you planned to do, and act to make improvements – see Figure below.



**Figure 1 The Denning Cycle**

ISO 14001 is the most widely used EMS standard, and is one of a broad range of environmental management standards in the ISO 14000 series. ISO 14001 is currently being revised. The purpose of the revision is to provide clarification of the original text and to ensure, as far as possible, compatibility with the ISO 9000:2000 quality management systems standards. It is expected that a revised edition of ISO 14001 will be published at the end of 2004.

## EMS Definition

An EMS is defined in the latest draft revision to ISO 14001 (ISO/DIS, 2003) as:

**"Part of an organisation's management system used to develop and implement its environmental policy and manage its interaction(s) with the environment".**

Note 1 to the definition states, "A management system is a set of interrelated requirements used to establish policy and objectives and to achieve those objectives". Note 2 states "A management system includes organisational structure, planning activities, responsibilities, practices, procedures, processes and resources".

ISO 14001 provides an organisation's management with a structured framework for identifying, evaluating, managing and improving its environmental performance. ISO 14001 uses the term 'organisation' to describe the entity that falls within the scope of an EMS.

'Organisation' is defined as:

**"company, corporation, firm, enterprise, authority or institution, or part or combination thereof, whether incorporated or not, public or private, that has its own functions and administration".**

This gives a great deal of flexibility over where the boundaries of the EMS can be set.

An EMS helps to ensure that the organisation's overall environmental objectives, as set out in its environmental policy, are implemented throughout the organisation and that employees, contractors and suppliers know their roles and responsibilities in helping the organisation to achieve them. Regular measurements, monitoring and auditing of the organisation's environmental performance and the system that is put in place to improve it, provide management with a basis for evaluating the effectiveness of the EMS and making changes as appropriate. A core principle of an EMS is that of continual improvement, thereby leading to better environmental performance by the organisation on a sustained basis.

The following sub-headings set out the different elements of an EMS.

### ***Environmental policy***

Central to an EMS is the environmental policy. The environmental policy is a declaration of the organisation's overall aims and principles with respect to the environment, as defined by its senior management. It must

include a commitment to the continual improvement of environmental performance and to compliance with environmental legal and other requirements. The policy must also be publicly available.

All organisations have, to some extent, an effect on the environment. The policy should recognise this and give emphasis to those effects that are the most significant. The policy should also be used to communicate aims and objectives to employees and other interested parties including shareholders, customers and suppliers. In the case of a multi-site operation there may be a number of group or divisional operating statements which, when combined, represent the view of the company as a whole. The organisation's environmental policy may be integrated with its other policies (e.g. health and safety, quality) or it can be a stand-alone document. In order to demonstrate the commitment of senior management to the environmental policy, it is often signed by the organisation's chairman or chief executive.

## ***Identification and evaluation of environmental impacts***

A key element of an EMS is the process of identifying and evaluating the organisation's impacts on the environment (environmental impacts may be positive or negative, beneficial or adverse), and its activities, products and services that cause them (these are referred to as *environmental aspects* in ISO 14001). The evaluation is important as it ensures that the EMS is focussed on the environmental issues that really matter (those that are most significant) and that resources and management time are concentrated on controlling and improving them.

The identification of significant environmental aspects needs to take account of the legislative, regulatory and other environmental requirements that affect the organisation. These may be pollution control permits, laws and regulations relating to the disposal of waste, or contractual requirements which specify environmental criteria required by customers of the organisation. For each of these significant environmental aspects, it is important that the EMS is set up to provide assurance to management and others who might have an interest (e.g. environmental regulators and customers), that they are being properly managed and the organisation is able to comply with the requirements. It is good practice to consult with key stakeholders to identify what their expectations are of your organisation's environmental performance. They might have useful information and the consultation process might help to prioritise which are the most important issues to address in your EMS.

## ***Environmental Review***

When establishing an environmental management system, many organisations undertake an environmental review. The environmental review is a systematic process to:

- determine the impacts the organisation has on the environment, and which of them are significant;
- understand which of its activities, products and services cause the significant impacts;
- know which of its activities, products and services are covered by environmental legislation and regulations, whether it is complying with them and whether this can be sustained on an ongoing basis;
- know the extent to which it is controlling its significant environmental aspects and whether effective controls are already in place; and
- be in a position to develop objectives and targets for environmental improvement and implement additional operational controls where they are necessary.

An easy way to get started on the environmental review is to map out the boundaries of the EMS and highlight areas where there are environmental considerations (this is referred to as Eco-Mapping). These could include internal and external drainage plans, chemical storage points, location of waste skips, chimney stacks from boilers and the nearest neighbours. Alternatively, if the EMS doesn't lend itself to being identified on a map (this is particularly the case for service organisations), a process flow diagram highlighting inputs and outputs might be more appropriate.

The EMS should address direct and indirect environmental aspects. Direct aspects are those caused as a direct result of the organisation's operations, whereas indirect aspects are those over which the organisation has influence, but no direct control. Examples of environmental aspects include:

- emissions to air;
- releases to water;
- disposal of waste and contamination of land;
- use of energy, raw materials and natural resources;

- land use and habitat loss;
- disposal of the organisation's products by customers; and
- environmental performance of contractors and suppliers.

Consideration should be given to impacts caused during normal and abnormal operating conditions and periods of maintenance and shutdown, and to significant environmental impacts that could occur during emergencies. Once impacts have been identified, their significance should be evaluated.

## ***Assessment of significance***

Assessing the significance of an environmental impact is one of the most difficult parts of environmental management. There are many different tools and techniques and, frequently, more than one approach can be used for a given situation. In many circumstances, professional judgement will play an important role in determining how to address significance and this can be helped through consultation with appropriate stakeholders. The significance of an environmental impact can be assessed through consideration of:

- size, nature, frequency, likelihood and duration of the environmental impact;
- the sensitivity of the receiving environment and the extent to which the impact is reversible;
- the extent to which the impact (or the activity, product or service which causes it) is covered by environmental laws and regulations, or contractual requirements; and
- the importance of the impact to interested parties – e.g. employees, neighbours, regulators.

It is important that the criteria for evaluating significance are clearly defined and that the procedure and outcome are capable of being replicated by someone else. Some organisations develop risk matrices to help them evaluate the significance of an environmental impact and to prioritise its relative importance; however, care should be taken to ensure that all significant impacts are identified and that there is a robust means of allocating the scores.

## ***Operational control, targets and objectives***

The results of the environmental review and the evaluation of the significance of the environmental impacts are used to identify operational control measures and to set objectives and targets for environmental improvement. Objectives and targets need to relate to the organisation's environmental policy and its environmental aspects. All significant environmental aspects will require operational controls to ensure that actions are carried out as planned and some of them will require objectives and targets for improvement.

Objectives are broad-based environmental goals that the organisation sets itself for environmental management and improvement. They may relate to a specific environmental issue, for example:

- to reduce the overall amount of solid waste produced over the next five years by 25%; or
- to manage issues which will help to deliver the policy – eg to ensure that all employees receive appropriate environmental training by the end of the financial year.

Targets are detailed performance requirements that need to be met in order to achieve the objectives. A number of targets might be required to achieve a particular objective. In some cases, objectives and targets might relate to the need for further research and analysis on how to achieve improvements. Where possible, objectives and targets should be SMART – Specific, Measurable, Achievable, Relevant and Time-related. This will help to track progress and ensure that achievements are being realised.

## ***Environmental programme***

The environmental programme turns the environmental objectives and targets into practical actions that can be taken to improve the organisation's environmental performance. The programme should identify individual responsibilities and the means to achieve the defined objectives and targets within the specified time scales. It should translate the commitment to continual environmental improvement set out in the environmental policy into practical actions.

## ***Structure and responsibilities***

The organisation's management will need to assign tasks to people so that everyone knows what has to be done. It is vital, if the system is to operate effectively, to know who does what, how, when and with what authority.

Whatever the size of the organisation, the activities of all employees will have an impact on the environment. Directly or indirectly, significant or small, everyone can contribute positively by innovating with new ideas, changing behaviour and involving other people. This will require information, training and the development of new skills. Different people in the organisation will need different types and levels of training: some will require general environmental awareness training; others training as auditors; the design team might need training on how to integrate environmental considerations into new product designs. The key is to make sure that people are given the knowledge and skills to fulfil their roles in the EMS and to be able to achieve the environmental targets and objectives they have been assigned responsibility for.

## **Communication**

An EMS relies on good communications for it to be effective. Internal communication needs to ensure that people are kept up to date with how progress is being made against environmental objectives and targets, and that they are able to influence the development of the EMS and environmental improvement programmes. External communications help to ensure that stakeholders are kept informed of the organisation's progress and can be engaged in the improvement process.

## **Procedures and documentation**

The EMS must be documented and procedures need to be established to ensure that everyone knows how the system operates and what is required. Documents should be kept up to date and controlled so that only the most recent versions are available for use. Procedures should be established to ensure that activities are carried out in the appropriate manner.

Contrary to popular belief, ISO 14001 doesn't require extensive documentation. Long narrative procedures may be required in some circumstances, but a flow diagram might be equally effective in ensuring that a task is carried out properly. Wherever possible, organisations should build on existing systems and integrate environmental issues into them, rather than developing them separately.

## **Monitoring, audit and periodic evaluation of legal compliance**

Information on the environmental performance of the organisation is essential if it is to track progress against its environmental objectives and targets. Without reliable and robust data, it can not be sure that it is in control of its environmental performance, or that performance is improving as intended. In many cases the organisation will already be carrying out measuring and monitoring activities, for example as a requirement of a pollution control licence, and should build on these in its EMS.

One of the important requirements in ISO 14001 is for organisations to carry out a periodic evaluation of legal compliance. This is a key task, which will help to inform the organisation on its performance against environmental laws and regulations and provide information on whether it is adhering to its environmental policy. The frequency with which the organisation carries out the periodic evaluation should depend on the potential environmental impacts of the activity, with the most significant being checked more often than those of lesser importance.

Auditing helps to determine whether the planned elements of the EMS are being implemented as intended and that the EMS is functioning as planned. It also provides information to management on the overall performance of the system. Further information on environmental auditing can be found in *ISO 19011:2002 Guidelines for quality and/or environmental management systems auditing* or in *Annex II of the EMAS Regulation 761/2001*.

## **Management review**

The EMS operates as a cyclical process of identifying, improving and checking. Periodic reviews by management ensure that the EMS is achieving the desired outcomes and that the environmental policy is being implemented. It will also provide a means for management to review the organisation's environmental performance trends to ensure that performance is being improved and to instigate changes to the system as necessary.

## **EMS certification and accreditation**

Organisations may decide to have an external body confirm that their EMS meets the requirements of ISO 14001, this is known as certification. Certification is not mandatory, ISO 14001 does allow organisations to self-certify that they have met all of the requirements of the standard. However, there are a number of benefits that can be gained by an organisation having its EMS externally certified, including:

- confidence that the EMS meets recognised requirements and standards;

- a means of maintaining momentum and helping to keep the EMS 'alive' and dynamic and driving forward the process of continual improvement;
- a fresh pair of eyes to review the EMS and the way that it functions; and
- the potential for recognition for their achievements from third parties, such as customers and environmental regulators.

Whilst organisations use ISO 14001 as the specification for the EMS, certification bodies use ISO Guide 66 (ISO, 2003) as the specification for how they should operate. ISO Guide 66 is being revised and is scheduled to be published as ISO 17021 'General Requirements for Bodies Providing Assessment and Certification of Management Systems', in 2006.

In order to ensure that certification bodies undertake their EMS assessments in a similar and comparable way and that certificates issued by different certification bodies are equivalent, a process of accreditation has been established. National accreditation bodies undertake assessments to ensure that certification bodies carry out their assessments appropriately and use competent people. In the UK, the United Kingdom Accreditation Service (UKAS) is the national accreditation body, for further information go to [www.ukas.com](http://www.ukas.com).

An International Accreditation Forum (IAF) has been established to ensure consistent standards between accreditation bodies, which is achieved through a process of peer review. The IAF has published guidance to help participating accreditation bodies undertake their work (IAF, 2001). Accredited certification to ISO 14001 is usually the only form of recognition that is given by customers and regulators, so you should check that your certification body is accredited through the IAF process.

## Further Information

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