Environmental management systems in plastics processing

TANGRAM
TECHNOLOGY

Environmental management systems in plastics processing

Practical worksheets for industry

CONTENTS

Part 1 - Clean business = good business 4
Part 2 - Starting out 6
Part 3 - Managing interactions with the environment..... 8
Part 4 - The basic EMS system..... 10
Part 5 - Operating an EMS system 12

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THE WASTE HIERARCHY

Clean business = good business

Environmental management systems are rapidly becoming an important issue in the plastics industry. Many companies are under pressure from their customers to develop an Environmental Management System (EMS), whilst others recognise the environmental impacts of their business and want to minimise these. Perhaps the most important reason is that companies who have implemented an EMS have often improved their environmental performance and also achieved substantial cost savings. An EMS with a strong emphasis on minimising waste and continual improvement will help your company to reduce costs.

This series of Worksheets explains how to implement an EMS that is focused on waste minimisation to reduce costs and environmental factors while still effectively complying with legislation and customer requirements.

A good EMS is a practical management tool to help you:

- Identify, assess and manage the environmental consequences of operations.
- Reduce waste and operating costs.
- Gain a competitive advantage.
- Establish and show a system for continual environmental improvement.
- Demonstrate compliance with legal obligations.
- Improve your public image.

Waste minimisation and EMS

An EMS focused on waste minimisation will produce cost savings from reduced waste, scrap, rework and energy use. A recent survey found that the average first-pass rejection rate in the polymer processing industry was over 10%. This increases all operating costs as well as reducing capacity (i.e. the lost opportunity to produce saleable product). As well as the obvious cost of waste disposal, the true cost of waste also includes labour, regrinding costs, raw material value and energy consumption.

Many businesses spend around 4% of their turnover generating waste. The cost of waste is not just the cost of disposal, but includes wasted raw materials, water, consumables and labour. The true cost of waste can be between five and 20 times the disposal cost , and for an average company, is around ten times the cost of disposal.

The Waste Hierarchy

All waste costs money. Eliminating or reducing waste not only benefits the bottom line but also has environmental benefits by reducing the use and waste of resources.

The 'waste hierarchy' helps to identify the most cost-effective opportunities to reduce waste and save money. Focusing on the top levels of the waste hierarchy (i.e. eliminate, reduce and re-use) within the framework of their EMS optimises the benefits.

What does an EMS involve?

An effective EMS will include:

- An assessment of the environmental aspects and impacts of the company's activities, products, processes and services.
- An environmental policy.
- An environmental improvement programme with objectives and targets.
- Identified roles and responsibilities for all employees.
- A training and awareness programme.
- Written procedures to control activities with a significant environmental impact.
- A controlled system of records.
- A programme of regular auditing.
- A formal review process for the EMS.

Approaches to EMS

This series of Worksheets uses the ISO 14001 model to explain the operation of an EMS but it is also possible to follow the EC's Eco-Management and Audit Scheme (EMAS) or even to develop an in-house EMS. Companies using the first two approaches can obtain formal certification to ISO 14001 or EMAS verification.

It is not necessary to get external recognition of an EMS to obtain many of the benefits but the formal approach increases the commitment to continual improvement and to identifying opportunities for ongoing improvements and cost savings. External recognition increases the credibility of an EMS with customers and suppliers and provided you have systematically and properly implemented your EMS then certification does not require much more effort.

Key factors for success

Gain senior management commitment

Strong senior management commitment is essential to ensuring the successful implementation and operation of an EMS. The benefits and aims of the EMS should be explained to senior managers before starting the implementation process (see **GG125** in the 'More Information' box). Convincing senior managers will require a project plan and a detailed estimate of the potential costs and also the potential cost savings from adopting an EMS.

Build on existing systems

There will be links between existing quality management, health and safety

management and other management systems.
These links should be reinforced and not re-invented. Remember that it is environmentally good to re-use so do it with procedures as well e.g. document control procedures used in other management systems may be suitable for use in the EMS.

Getting certified

To be ready for certification to ISO 14001, the EMS should have been fully operational for at least three months and at least one Management Review should have been conducted. For initial registration, participants need to have a fully operational EMS with an audit programme already in place and started, and to produce an initial and validated Environmental Statement. The requirements for these will be covered in later Worksheets.
Many companies use the same certification body for their EMS as for their QMS. However, it is important to check that your certifier is accredited by the United Kingdom Accreditation Service (UKAS) for ISO 14001 certification. You should also check that the proposed certifier/verifier has relevant experience in the plastics industry.
Certifiers use a range of methods for certification. Make sure you understand the different stages of the proposed certification process and what the certifier will be looking for at each stage. Ask your chosen certifier to run through the process of certification with you.
Before the certifier visits the site for the first time, hold a meeting to ensure everyone knows about the certification and what it will entail.
An 'Initial Review' will help you to gather the data that will give a 'snapshot' of where your company is now with environmental issues. Regular reviews will help you to quantify the savings made and maintain the momentum for implementing your EMS.
Formal certification of an EMS is a significant milestone but it is not the end of the journey. Every EMS needs continued attention to deliver continual improvement and savings. This must be appreciated by senior managers - otherwise the initial enthusiasm for the EMS may decline after certification is achieved.

What to do next

Implementing an EMS with a focus on waste minimisation and continual improvement will help to reduce costs and improve environmental performance. The practical steps in implementing an EMS are:
•Obtain commitment from senior management (use the free information from

GG125 to prepare a business case).
•Understand the main elements of an EMS to ISO 14001 and familiarise yourself with the standard's requirements.
•Appoint someone to oversee the implementation and operation of the EMS.
•Develop an environmental policy.
•Identify your company's environmental aspects.
•Evaluate the significance of your environmental aspects and draw up an Aspects Register.
•Identify legislative requirements and draw up a Register of Legislation.
•Set objectives and targets.
•Assign responsibility.
•Develop employee awareness and conduct training.
•Prepare procedures to deliver operational and document control.
•Implement a programme of regular monitoring and measurement of significant aspects, e.g. waste, water use and energy use.
•Develop an internal audit mechanism and timetable.
•Review progress and, if necessary, revise your policy, objectives and targets.

This series of Worksheet will cover most of these activities in the coming months.

More Information

•*Waste Minimisation Pays: Five business reasons for reducing waste* (GG125).
•*Environmental Management Systems for the plastics industry (GG251).*
•*Finding and reducing waste in plastics processing (GG277).*
Available free from the Environment and Energy Helpline 0800 585 794

TARGETS MUST BE:

Specific

Measurable

Achievable

Relevant

Time-limited

Starting out

Implementation planning

Planning and organisation is vital to successfully implementing an EMS and it is important to involve a range of people in EMS implementation, particularly when the EMS overlaps with their normal roles or functions. A formal implementation team will help to keep the EMS on track and identify and remove obstacles to progress. The team should include a representative from:

- Environmental/health and safety
- Quality
- Production;
- Senior management.

Representatives from the purchasing, finance and personnel departments may also need to be involved from time to time. An EMS 'champion' should be made responsible for implementing the EMS and co-ordinating the efforts of the implementation team . The team should agree a common and collaborative approach and share out the work. To ensure progress is made, it is essential that team members be allocated sufficient time and resources.

The team should meet regularly - perhaps fortnightly - with adequate secretarial support to ensure minutes are taken and, most importantly, action plans are updated. To keep the whole project on track, the EMS champion should review any action plans weekly. The EMS champion may also find it useful to set up separate teams to tackle specific issues such as waste minimisation, packaging use, water use and energy efficiency, and should involve employees from all levels of the business. Using a senior manager to steer the team and provide an overview will facilitate progress and ensure good communications with senior management.

Timescale for implementation

The time to implement an EMS is usually around 12 - 18 months but there is no correct or standard timescale for developing an EMS and other business pressures may take precedence. Where customers are demanding an EMS, they will often accept a reasonable timescale provided it is accompanied by a good, realistic implementation plan.

Initial review of operations

An Initial Review will help assess how the company operations affect the environment and provide benchmark data to help achieve continual improvement. ISO 14001 does not insist on a formal Initial Review, but it does require an assessment of environmental issues and impacts.

Carrying out an Initial Review will help to:

- Gain a strategic overview of the company attitude to waste and environmental issues.
- Prepare/revise the environmental policy.
- Identify the environmental aspects of activities and their impacts.
- Assess relevant legislation.
- Identify opportunities to improve performance.
- Set objectives and targets for improvement.

The main tasks in an Initial Review are data gathering and analysis. Relevant data may be held by many different managers and operators. Checklists and worksheets provided in GG251 (see box at right) to help identify and locate the documents needed to determine the company's environmental aspects and impacts. All documents gathered for the Initial Review should be filed for future reference. The Worksheets can be used to collect information about:

- The site and its environmental history.
- Raw material consumption and storage.
- Utility consumption and costs.
- Solid waste amounts and management.
- Emissions to atmosphere.

The environmental policy

When the Initial Review is complete it is possible to write an effective environmental policy. The statements made in the policy should be reasonable and practical and match the business needs. The policy may commit the company to different management approaches and both customers and members of the public may want to see it. It should be reviewed regularly and, if necessary, revised to take account of developments in the EMS.

Section 4.2 of ISO 14001 requires a written environmental policy and has requirements for the policy.

The policy should make references to the aims for significant environmental aspects, refer to continual improvement (through objectives and targets) and compliance with legislation. It could also refer to:

- Training and awareness for employees.
- Working with the supply chain to improve environmental performance.
- Planning for emergencies.
- Relations with neighbours and regulators.
- The concept of sustainability.

The policy should be signed and dated by a senior manager and made available to all employees, customers and other stakeholders.

Objectives and targets

Setting objectives and realistic targets is

the best way to achieve continual improvement and give maximum savings from an EMS.

Section 4.3.3 of ISO 14001 requires that objectives and targets be set for continual improvement.

Objectives

These are the guiding aims of the EMS and should be set to achieve improvements in:

- The significant environmental aspects.
- The environmental policy.
- Technical options.
- Financial, operational and other business requirements.

Targets

An objective can have more than one target and setting targets for each objective gives a short-term measurable goal for performance assessment. Opportunities to reduce waste identified during the Initial Review can aid target setting, e.g. a 15% reduction in packaging use and 10% reduction in water consumption within a year.

Targets should always be SMART and can be one of three types:

Measurement: Improvement targets cannot be set without base-line measurements.

Improvement: Measuring an aspect and then identifying the scope for improvement allows improvement targets to be set (quantify the cost/benefits for senior managers).

Control: After improvements have been made, control targets are used to 'hold the gains'.

Owners for individual targets should always be identified to ensure that the workload is shared out, that individuals are clearly responsible for different issues and that they know where to focus their efforts.

Checklist:

☐ Written objectives and targets for each relevant function and level for the company.

☐ A written procedure for setting objectives and targets.

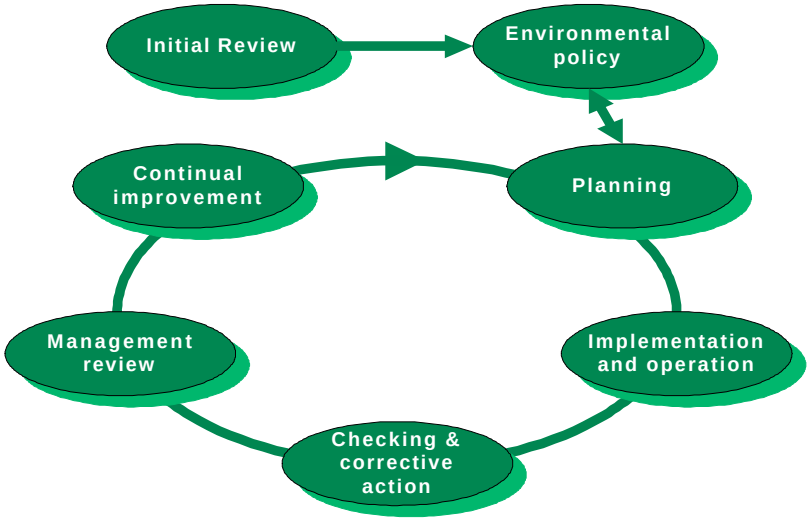
☐ Records of previous objectives and targets and a summary report on performance (also needed for the Management Review).

Legal requirements and EMS

Compliance with the law is a key part of any EMS. The way to be confident of full compliance is to put the appropriate controls in place. It is necessary to:

- Identify a source of guidance to all environmental legislation (e.g. the Environment and Energy Helpline).
- Identify the legislation relevant to the site and operations.

The EMS Improvement Cycle



- Get a copy of the Acts, Regulations or Codes of Practice as necessary.
- List the appropriate legislation and how it applies to the site in a 'Register of Legislation'.

Section 4.3.2 of ISO 14001 requires a procedure to identify and obtain access to all environment-related legal requirements.

The method used to identify the legal requirements should be a procedure within the EMS. This procedure should require at least an annual review/update of the Register and the review should be linked to an annual assessment of compliance. When the Register is updated, key changes should be summarised at the front and relevant employees should be notified. If you are not sure which legislation, regulations and codes of practice apply to your site, you should seek specialist advice. Advice on all environmental legislation affecting plastics processors is available from the Environment and Energy Helpline.

Checklist:

☐ A written procedure to identify legal and other requirements applicable to the site's environment-related activities.

☐ A procedure that ensures managers are aware of forthcoming legislation that may affect the company

☐ A 'Register of Legislation'

☐ All permits, authorisations, etc required under current legislation

☐ Proof of updating of the Register of Legislation.

More Information

- *Environmental Management Systems for the plastics industry (GG251).*
- *Finding and reducing waste in plastics processing (GG277).*

Available free from the Environment and Energy Helpline

0800 585 794

Companies often find that compiling a list of environmental aspects and impacts and assessing their significance is the most difficult stage of implementing an EMS.

Managing interactions with the environment

Identifying and understanding how a company interacts with the environment helps to develop an effective EMS to reduce waste and improve environmental performance. This Section explains how to identify environmental aspects and assess their significance. The information gathered during the Initial Review provides a starting point for this part of the EMS. Aspects are the 'cause' of an environmental impact or effect. Environmental aspects also include measures you have already taken to prevent or reduce pollution.

ISO 14001 requires demonstration that all possible environmental aspects have been considered and evaluated.

Identifying activities and processes

Start by making a list of the various departments on the site, e.g. manufacturing, utilities, stores and engineering maintenance (also include upstream and downstream processing activities such as goods inward, assembly, printing, packaging and dispatch) and then identify the different processes that make up these activities.

Process mapping

Draw a box for each activity and add the inputs and outputs to this diagram.

Remember: consider emissions to air, water, and land (as waste or through spills) on the process map - however small they may be. The process map will help to identify all of the environmental aspects and clarify the operations where waste may be arising as well as opportunities for waste reduction. Also consider what happens under abnormal situations, e.g. start-ups, shutdowns and cleaning, as well as the potential for incidents and accidents.

Remember:

- Non-core processes.
- Refrigerants in cooling and air conditioning
- PCBs in electrical transformers.

Normally these will not escape into the environment, but the EMS should have procedures for dealing with them during maintenance and final disposal.

Identifying aspects

From the process map, decide which inputs and outputs may interact with the environment and are, therefore, environmental aspects.

Remember: include aspects that are not covered by legislation - they may still be significant.

Identifying impacts

Impacts cannot be directly controlled - they are generated by the aspects previously identified. An aspect can generate more than one impact and many aspects have indirect impacts. Electricity use (an aspect) has three indirect impacts, i.e. climate change due to carbon dioxide emissions, air pollution from acid gas emissions and resource depletion through fossil fuel use.

Assessing significance

The next task is to assess which aspects are significant. Environmental aspects that are judged to be significant are the ones that will be managed by the EMS. The Initial Review should reveal which activities are covered by legislation and/or have a high cost. These will be areas where improvement activities will have a high beneficial environmental impact and significantly reduce costs.

Assessing significance through a formal procedure enables:

- Concentration on taking action to reduce major impacts.
- Effective use of resources.
- Avoiding having to try to deal with all impacts (including insignificant ones).

Section 4.3.1 of ISO 14001 requires identification of significant aspects (those that have a significant impact on the environment) using a formal procedure. ISO 14001 does not specify a set method for assessing the significance of environmental aspects. However, the procedure used to assess significance should be recorded in a systematic manner for future reference. Accredited certifiers will want to see these records.

When assessing significance:

- Be consistent.
- Use criteria that provide a rational basis for the rest of your EMS.
- Record the method and decisions in a systematic manner.

There is no set or prescribed method for assessing the significance of environmental impacts. There are various techniques to assess significance - choose the approach that is the most appropriate to the company. The keys to success are:

- Develop a consistent approach that allows each issue to be clearly treated in the same way.
- Be able to demonstrate and justify the methodology used.

Risk assessment method

- This approach uses conventional risk assessment methods to predict the likelihood and severity of outcomes or events. It is similar to the Failure Modes Effects Analysis (FMEA) approach used in quality and design management. It is also similar to some of the risk assessment

methods used in Health and Safety. In all these methods, ratings of severity, likelihood and detection are individually assessed and then combined to produce an overall assessment of the risk.
A risk factor rating is assigned to each potential impact after considering the following:

- Hazardous properties.
- Size.
- Frequency or likelihood of occurrence.
- Presence of sensitive environmental receptors, e.g. people, a watercourse and/or site of special scientific interest.
- Presence or absence of environmental controls, e.g. techniques designed to control or prevent the environmental impact.

For each impact, decide the degree of severity (minor, moderate, major) and how likely it is to occur (unlikely, likely, very likely). A total risk assessment is obtained by combining the severity of the consequences with the likelihood of occurrence for each impact. A numerical rating is given to each, with a negative number indicating an adverse impact.

Numerical rating/weighting method

This method gives a score to each impact to quantify the importance of different criteria.

Step 1: Normal operating conditions

Each impact is awarded a score under normal operating conditions. These scores reflect the relative importance of major issues such as:

- Legislation.
- Environmental damage.
- Interested parties.
- Quantity.

Scores are weighted according to the likely effect of the impact. The weighting assigned to each issue is arbitrary but should reflect the company's priorities. Comparing total scores for each impact allows prioritisation of efforts under normal operating conditions.

Step 2: Other operating conditions

Each impact is given a score under other operating conditions such as:

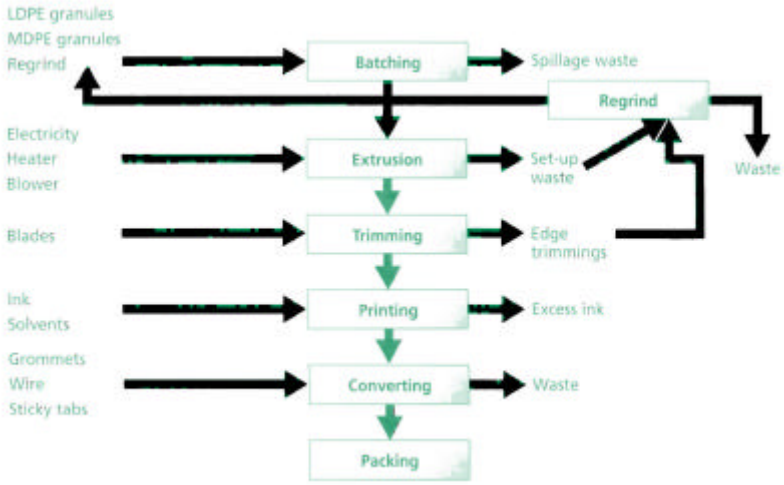
- Abnormal operations.
- Accident/emergency.
- Past activities.
- Planned activities.

Allocating scores to these conditions allows the overall importance of the impact to be calculated.

What is significant?

After assessment, an impact is considered significant if the score is above a threshold value. For risk assessment methods, the absolute score is the important value for ranking. For numerical weighting methods, some impacts may be significant in only one category, others in both. Each company can set the scores over which impacts are considered significant but the reasons for the decision should be recorded.

Typical Process Map



Recording decisions

The reasons for decisions should be recorded in a systematic manner for future reference and to show to accredited certifiers.

Written procedure for evaluating significance

The procedure to identify aspects and assess them for significance must be recorded and produce consistent results for each site.

Aspects Register

The collection of lists of environmental aspects and evaluation of significance make up the 'Aspects Register'. This Register should give details of the company's environmental aspects, together with an analysis of their impacts. It should indicate whether an aspect is considered significant and how significant environmental aspects are linked to the EMS.

Checklist:

- ☐ A written procedure to identify environmental aspects and to evaluate those with significant environmental impacts.
- ☐ An Aspects Register.
- ☐ Process maps and evaluation tables (the proof of the process).
- ☐ An environmental policy.

Remember to assess new projects according to the chosen method and to link the evaluation procedure to the capital expenditure application and authorisation process.

More Information

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- *Environmental Management Systems for the plastics industry (GG251).*
- *Finding and reducing waste in plastics processing (GG277).*

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Envirowise publications provide sample documents and forms that will assist in writing many of these procedures.

The basic EMS system

This Worksheet concentrates on operating the EMS and considers many of the areas where ISO 14001 makes specific demands.

Management programme

This is a written programme of work stating when and how the objectives will be achieved, and who is responsible for achieving them. This helps effective EMS implementation and ensures a systematic approach to waste minimisation and optimum benefits. The Management Programme is not a detailed project plan, but should include deadlines for completing the tasks associated with the objectives and targets.

Section 4.3.4 of ISO 14001 requires a Management Programme to enable objectives and targets to be achieved.

One key to success is to set intermediate deadlines for each objective. This enables objectives to be completed in small, manageable parts and defines clearly 'what', 'who' and 'when'. Give ownership of each target to a responsible individual and set 'milestones' to allow the objectives, the targets and the Programme to be audited.

Checklist:

☐ A written programme of work outlining when and how the objectives and targets of the EMS will be achieved.

Organisation and structure

Senior management commitment and correctly delegated power and responsibility are vital for the success of the EMS.

- Ensure a senior manager has responsibility for the system at Board level.
- Formally define the roles of the EMS champion and the implementation team.
- Include key roles and responsibilities in the job descriptions of relevant employees.

Section 4.4.1 of the standard requires ensuring that roles and responsibilities with regard to environmental management are clearly defined and documented.

Checklist:

☐ An organisation chart with asterisks highlighting the members of the EMS team.

☐ Current job descriptions.

Training

Training is an essential requirement for the success of an EMS. It should raise general awareness of environmental issues and also provide specific technical skills.

When developing the EMS, a training needs assessment matrix should be produced. This will include the relevant job functions and the different types of technical knowledge required to operate the EMS.

- Identify the issues and procedures where employees need training and the key roles that need training.
- Ensure that all employees (including new recruits) receive a basic training in environmental awareness, waste minimisation and the elements of the EMS. It is important to provide proof of training and to ensure that if a key training session is missed then this is rescheduled for a later date. Many Quality Management Systems (QMS) also include procedures for recording training needs and attendance.

Section 4.4.2 of ISO 14001 requires the identification of training needs in a structured and documented method and the development of a training programme.

To maximise cost-effectiveness and minimise inconvenience, training sessions can be run between shifts to reach a larger audience.

Note: It is not sufficient to provide training just once. Refresher training and further specialist training may be necessary for the system to mature and provide good results.

Checklist:

☐ A formal, documented procedure to assess training needs.

☐ A written plan to deliver the training.

☐ Records of training materials.

☐ Signed training attendance forms.

Communication

Communicating the reasons for the EMS, the role of individuals and the progress being made will help to achieve ownership of the EMS by all employees and maintain the momentum for continuous improvement. Tell the outside world what is being done and what has been achieved to improve public and customer perception and show that you care for the environment.

Section 4.4.3 of ISO 14001 requires procedures for internal and external communication.

Procedures should record the way you do things as simply as possible.

Internal communications

The procedure should specify the methods, e.g. newsletters and posters and, the approximate frequency of communication. Information of relevance to the EMS - current performance, successes, incidents, new legislation, site improvements, awards - should be communicated, and records kept to prove the communications took place.

External communications

The procedure is to ensure that:

- Communications to and from external interested parties are received, documented and responded to by the correct person.
- Records of the content of communications are held.

Section 4.4.3 of ISO 14001 requires consideration of external reporting of significant environmental aspects. The decision should be recorded in the Management Review minutes.

After progress with the EMS, the annual performance data could form the basis for either an internal or an external report.

Checklist:

☐ Procedures for internal and external communications.

☐ Records of internal communications.

☐ An external communications log.

Management manual

The Management Manual acts as a guide to the EMS procedures and documents and describes the entire system.

The Management Manual should include:

- A brief history of the company.
- The environmental policy.
- A description of how the EMS works.
- A list of EMS procedures.
- Descriptions of key management responsibilities and an organisation chart.

Section 4.4.4 of ISO 14001 requires the maintenance of information describing the EMS.

The format of the Management Manual can follow the format of any existing quality management manual. It is possible to produce a joint Quality, Environmental and Health and Safety Manuals and to refer to it as the 'Company Manual'.

Checklist:

☐ A collection of documents forming an Environmental Management Manual.

☐ A manual providing good links to all other parts of the system.

Document control

Document control for an EMS is similar to that in a QMS. There should already be a suitable document control procedure in your ISO 9000 system if you are certified.

Document control relies on:

- Systematic numbering of documents with a title, date and version number.
- Review, revision and approval procedures.
- Controlled withdrawal of obsolete documents and issue of new versions.

Section 4.4.5 of ISO 14001 requires a procedure for document control.

Checklist:

☐ A written procedure for document control.

Operational controls

Operational controls/procedures should be developed for all situations where their absence could lead to a deviation from the environmental policy. Keep procedures simple and use pictures and flow diagrams if possible. **Note:** Simple notices can be regarded as procedures if they are controlled by the EMS.

Every procedure should have an 'owner', who is responsible for writing the procedure, writing future updates and ensuring that the procedure is used. Decentralised ownership of procedures will spread out the work when they need to be updated.

Existing procedures developed for a QMS may be amended for ISO 14001. These can include procedures for:

- Bulk deliveries.
- Management of resource consumption.
- Site waste management.
- Control of pollution abatement plant.
- Energy management.
- Planned preventative maintenance (PPM) and inspection.

Section 4.4.6 of ISO 14001 requires the identification of critical activities related to significant aspects, policy, objectives and targets and the development of documented procedures. An examination of supply chain issues for contractors and suppliers is also required.

Checklist:

☐ Procedures for all situations where their absence could lead to a deviation from the environmental policy.

Remember:

Say you do and then do what you say.

More Information

- *Environmental Management Systems for the plastics industry (GG251).*
- *Finding and reducing waste in plastics processing (GG277).*

Available free from the Environment and Energy Helpline

0800 585 794

Envirowise publications provide sample documents and forms that will assist in writing many of these procedures.

Operating an EMS system

This Worksheet concentrates on operating the EMS and considers many of the areas where ISO 14001 makes specific demands.

Emergency procedures

Use the existing emergency procedures to develop a procedure to deal with emergencies that:

- Identifies the environmental risks associated with the emergency.
- Makes a broad assessment of possible emergency situations.

Section 4.4.7 of ISO 14001 requires a written procedure for dealing with emergencies.

Checklist:

☐ A written emergency procedure.

☐ Records/proof of tests of this procedure.

Monitoring and measurement

General principles of monitoring and measurement

The EMS should include a procedure for monitoring and measurements related to the significant aspects, including waste production. Data collection and analysis is a vital tool in reducing resource use and minimising waste.

Although ISO 14001 specifies a minimum frequency of annual measurements, more frequent measurement is necessary to identify variations and opportunities to reduce waste. The sooner corrective action is taken, the more cost savings will be achieved. The measurements can be used in the Management Review, displayed internally to report success and even turned into a full Environmental Report. Parameters that should be measured include:

- Production levels.
- Waste generated.
- Water use.
- Energy use.

Waste and utility data should always be related to a measure of production, e.g. tonnes of waste per tonne of product or tonnes of waste per number of units.

Measuring to manage: If you don't measure it then you can't manage it.

Section 4.5.1 of ISO 14001 requires procedures to monitor and measure significant aspects and impacts on the environment. There must be adequate calibration procedures for any measuring equipment used.

This section also requires an evaluation of compliance with all relevant legislation.

Calibration

A procedure is needed for the calibration of monitoring and measurement equipment.

Assessing legislative compliance

Assessment of legislative compliance should be performed at least annually, and always after updates to the Register of Legislation. For some issues, there may be a statutory requirement to supply compliance information to regulators more frequently.

Checklist:

☐ Procedures to measure raw material use, solid waste, water use, releases to water/sewer, emission to air, energy use, etc.

☐ Calibration procedures.

☐ A compliance assessment procedure.

Identifying and correcting problems

Non-conformances are system failures found during audits, inspections and day-to-day activities. They should be investigated and corrective action agreed. The same process should also be used to carry out preventative actions before things go wrong. Check any existing ISO 9000 quality procedures to see if an additional procedure is needed or simply changes to existing procedures.

Written records of non-conformances and agreed corrective/preventative actions must be kept by using a corrective action request form.

Section 4.5.2 of ISO 14001 requires procedures to ensure that when things go wrong (or don't follow the system), there is a process for recognising the non-conformance and defining corrective actions.

Checklist:

☐ Procedures for non-conformance, corrective action and preventative action.

☐ Forms to record non-conformances and corrective/preventative action.

☐ Reports on follow-up actions.

Keeping records

The records required for an EMS include:

- Aspects Register.
- Register of Legislation.
- Objectives and targets.
- Monitoring and measurement data.
- Operational data relevant to the EMS.
- Non-conformance and corrective action forms.

•Audit reports.

There are legal requirements for the retention of some environmental documents and, although not a legal requirement, some other documents should be held forever to maintain the property asset value.

Keeping records should be dealt with under an ISO 9000 QMS and existing quality procedures may only need simple changes to meet the ISO 14001 requirements.

Section 4.5.3 of ISO 14001 requires procedures for the identification, maintenance and archiving of environmental records.

Checklist:

☐ A record-keeping procedure.

Internal audits

Internal audits are a systematic inspection and comparison of actual operating methods with policies, procedures, work instructions, etc. Environmental auditing helps to maintain environmental awareness and a sense of responsibility among employees.

There are three ISO standards dealing with EMS auditing. These cover 'General Principles', 'Audit Procedures' and 'Criteria for Auditors' (ISO 10010 to ISO 14012 respectively). Check that existing ISO 9000 audit procedures meet the requirements of ISO 14001 - particularly with respect to auditing objectives/targets and compliance with legislation.

Section 4.5.4 of ISO 14001 requires procedures for audits to periodically assess the effectiveness of the EMS in relation to both the standard itself and good environmental management. These procedures should also confirm that the system has been properly implemented and maintained.

An audit should focus on the significant environmental aspects and compliance with legislation.

An audit should allow you to:

•Determine whether the EMS has been implemented and maintained correctly.
•Verify that the system is working and is effective.
•Identify weaknesses in the system and/or areas for improvement.
•Assess compliance with the requirements of the EMS itself.

The auditor should have no management responsibility for the procedure being audited and should have been trained in auditing and the essential aspects of the procedure.

Audit frequency should be linked to the significance of the environmental impacts and all procedures must be audited at least once a year. The audit programme should take account of areas/issues identified for particular attention by previous audits.

Auditing often works best if the auditor has a list of key questions to ask about the procedure - preferably with simple yes/no responses. These questions can also be part of the procedure.

All non-conformances and agreed corrective/preventative actions should be recorded in an Audit Report and followed up to check that corrective and preventative actions have been taken.

Checklist:

☐ A written audit procedure.

☐ An audit programme.

☐ Audit reports.

Management review

Management Review allows senior managers to consider the effectiveness of the EMS. The discussion and its conclusions should be minuted and agreed actions implemented.

Section 4.6.1 of ISO 14001 requires regular reviews to assess the overall effectiveness of the EMS.

The agenda for management meetings should allocate time to discuss:

•Progress in achieving objectives and targets.
•Compliance with legislation.
•Audit reports.
•Non-conformance action reports.
•New processes and any changes to known environmental issues.
•New legislation.
•New customer requirements.
•Need for any revisions to the environmental policy, objectives and targets.

Senior management should consider whether to report externally on progress in reducing the impact of environmental aspects.

Checklist:

☐ A Management Review procedure.

☐ A Management Review agenda.

☐ Minutes of Management Review meetings.

Auditing checks if you are 'doing things right'. The Management Review should also check if you are 'doing the right things'.

More Information

•*Environmental Management Systems for the plastics industry (GG251).*
•*Finding and reducing waste in plastics processing (GG277).*

Available free from the Environment and Energy Helpline
0800 585 794