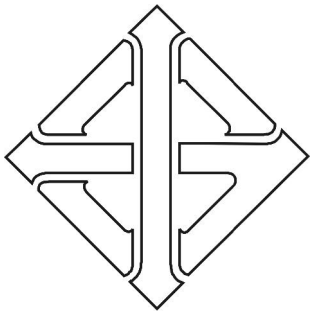

มาตรฐานผลิตภัณฑ์อุตสาหกรรม

THAI INDUSTRIAL STANDARD

มอก.14005-2555

ISO 14005 : 2010

ระบบการจัดการสิ่งแวดล้อม : แนวทางสำหรับการนำระบบการจัดการสิ่งแวดล้อมไปปฏิบัติอย่างเป็นขั้นตอน รวมถึงการใช้การประเมินผลสมรรถนะด้านสิ่งแวดล้อม

ENVIRONMENTAL MANAGEMENT SYSTEMS – GUIDELINES FOR THE PHASED IMPLEMENTATION OF AN ENVIRONMENTAL MANAGEMENT SYSTEM, INCLUDING THE USE OF ENVIRONMENTAL PERFORMANCE EVALUATION

สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม

กระทรวงอุตสาหกรรม

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มาตรฐานผลิตภัณฑ์อุตสาหกรรม

ระบบการจัดการสิ่งแวดล้อม : แนวทางสำหรับการนำระบบการจัดการสิ่งแวดล้อมไปปฏิบัติอย่างเป็นขั้นตอน รวมถึงการใช้การประเมินผลสมรรถนะด้านสิ่งแวดล้อม

มอก.14005-2555

สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม

กระทรวงอุตสาหกรรม ถนนพระรามที่ 6 กรุงเทพฯ 10400

โทรศัพท์ 0 2202 3300

ประกาศในราชกิจจานุเบกษา ฉบับประกาศและงานทั่วไป เล่ม 129 ตอนพิเศษ 188 ง

วันที่ 14 ธันวาคม พุทธศักราช 2555

มาตรฐานผลิตภัณฑ์อุตสาหกรรมนี้เป็นส่วนหนึ่งในอนุกรมมาตรฐานผลิตภัณฑ์อุตสาหกรรมระบบการจัดการสิ่งแวดล้อม ซึ่งเป็นเรื่องเกี่ยวกับระบบการจัดการสิ่งแวดล้อม : แนวทางสำหรับการดำเนินงานระบบการจัดการสิ่งแวดล้อมแบบเป็นขั้นตอน รวมถึงการใช้การประเมินผลสมรรถนะด้านสิ่งแวดล้อมโดยรับมาตรฐานระหว่างประเทศ ISO 14005: 2010 Environmental management systems – Guidelines for the phased implementation of an environmental management system, including the use of environmental performance evaluation มาใช้ในระดับเหมือนกันทุกประการ (identical) โดยใช้ ISO ฉบับภาษาอังกฤษเป็นหลัก

มาตรฐานผลิตภัณฑ์อุตสาหกรรมนี้กำหนดขึ้นเพื่อให้ทันกับความต้องการของผู้ใช้ และจักแปลเป็นภาษาไทยในโอกาสอันสมควร หากมีข้อสงสัยโปรดติดต่อสอบถามที่สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม

คณะกรรมการมาตรฐานผลิตภัณฑ์อุตสาหกรรมได้พิจารณามาตรฐานนี้แล้ว เห็นสมควรเสนอรัฐมนตรีประกาศตามมาตรา 15 แห่งพระราชบัญญัติมาตรฐานผลิตภัณฑ์อุตสาหกรรม พ.ศ. 2511

ประกาศกระทรวงอุตสาหกรรม
ฉบับที่ 4467 (พ.ศ. 2555)
ออกตามความในพระราชบัญญัติมาตรฐานผลิตภัณฑ์อุตสาหกรรม
พ.ศ. 2511
เรื่อง กำหนดมาตรฐานผลิตภัณฑ์อุตสาหกรรม
ระบบการจัดการสิ่งแวดล้อม : แนวทางสำหรับการนำระบบการจัดการสิ่งแวดล้อม
ไปปฏิบัติอย่างเป็นขั้นตอน รวมถึงการใช้การประเมินผลสมรรถนะด้านสิ่งแวดล้อม

อาศัยอำนาจตามความในมาตรา ๑๕ แห่งพระราชบัญญัติมาตรฐานผลิตภัณฑ์อุตสาหกรรม พ.ศ. 2511 รัฐมนตรีว่าการกระทรวงอุตสาหกรรมออกประกาศกำหนดมาตรฐานผลิตภัณฑ์อุตสาหกรรม ระบบการจัดการสิ่งแวดล้อม : แนวทางสำหรับการนำระบบการจัดการสิ่งแวดล้อมไปปฏิบัติอย่างเป็นขั้นตอน รวมถึงการใช้การประเมินผลสมรรถนะด้านสิ่งแวดล้อม มาตรฐานเลขที่ มอก. 14005-2555 ไว้ ดังมีรายการละเอียดต่อท้ายประกาศนี้

ทั้งนี้ ให้มีผลตั้งแต่วันประกาศในราชกิจจานุเบกษาเป็นต้นไป

ประกาศ ณ วันที่ 20 กันยายน พ.ศ. 2555

หม่อมราชวงศ์พงษ์สวัสดิ์ สวัสดิวัตน์

รัฐมนตรีว่าการกระทรวงอุตสาหกรรม

มาตรฐานผลิตภัณฑ์อุตสาหกรรม
ระบบการจัดการสิ่งแวดล้อม : แนวทางสำหรับการนำระบบการจัดการสิ่งแวดล้อมไปปฏิบัติอย่างเป็นขั้นตอน รวมถึงการใช้การประเมินผลสมรรถนะด้านสิ่งแวดล้อม

บทนำ

มาตรฐานฉบับนี้มีจุดมุ่งหมายเพื่อสนับสนุนและเป็นแนวทางให้องค์กร โดยเฉพาะองค์กรขนาดกลางและขนาดย่อม ใช้ในการพัฒนาและนำระบบการจัดการสิ่งแวดล้อมไปปฏิบัติให้เป็นไปตามข้อกำหนดของ ISO 14001 ข้อแนะนำนี้ไม่มีข้อกำหนดเพิ่มเติมจาก ISO 14001 ยกเว้น การรวมเรื่องการประเมินผลสมรรถนะด้านสิ่งแวดล้อมไว้ด้วย และไม่ได้มุ่งหมายที่จะใช้สำหรับการตีความ ISO 14001 หรือใช้ในการให้การรับรอง

องค์กรหลายองค์กรได้รับประโยชน์จากการมีระบบการจัดการสิ่งแวดล้อมอย่างเป็นทางการ แต่ยังมีอีกหลายองค์กร โดยเฉพาะองค์กรขนาดกลางและขนาดย่อมไม่มีระบบดังกล่าว แม้ว่าระบบจะให้ประโยชน์มากก็ตาม มาตรฐานฉบับนี้ใช้แนวคิดในการนำระบบการจัดการสิ่งแวดล้อมไปปฏิบัติอย่างเป็นขั้นตอน เพื่อพัฒนาให้เป็นไปตามข้อกำหนดของระบบการจัดการสิ่งแวดล้อม ISO 14001

แนวคิดการดำเนินงานอย่างเป็นขั้นตอนให้ผลดีหลายอย่าง กล่าวคือ ผู้ใช้สามารถประเมินผลได้ทันทีถึงผลตอบแทนที่ได้รับเมื่อเทียบกับเวลาและค่าใช้จ่ายในการจัดทำระบบการจัดการสิ่งแวดล้อม สามารถเห็นได้ว่าการปรับปรุงสิ่งแวดล้อมช่วยในการลดต้นทุน ปรับปรุงความสัมพันธ์กับชุมชน ช่วยในการแสดงถึงการปฏิบัติที่สอดคล้องกับกฎหมายและข้อกำหนดอื่น ๆ และช่วยในการดำเนินการให้เป็นไปตามความคาดหวังของลูกค้า โดยองค์กรสามารถติดตามผลประโยชน์ที่ได้รับจากระบบการจัดการสิ่งแวดล้อมขององค์กรได้ในขณะที่กำลังนำระบบไปปฏิบัติทีละขั้น โดยการเพิ่มหรือการขยายองค์ประกอบต่าง ๆ ที่ให้คุณค่าแก่องค์กร เมื่อองค์กรจัดทำระบบการจัดการสิ่งแวดล้อมที่มีขอบข่ายครอบคลุมผลิตภัณฑ์ กิจกรรม และบริการทั้งหมดขององค์กร โดยใช้ข้อกำหนดทั้งหมดของมาตรฐานฉบับนี้อย่างครบถ้วน จะช่วยให้องค์กรสามารถพัฒนาและนำระบบไปปฏิบัติให้เป็นไปตามข้อกำหนดของ ISO 14001

มอก. 14005-2555

ISO 14005 : 2010

ISO 14001 เป็นมาตรฐานระบบการจัดการสิ่งแวดล้อมระหว่างประเทศที่ได้รับการยอมรับอย่างกว้างขวาง ใช้แนวคิดเชิงโครงสร้างในการจัดการสถานการณ์ด้านสิ่งแวดล้อมขององค์กรซึ่งมีความสอดคล้องและเป็นรูปแบบพื้นฐานของแนวคิดระบบการจัดการอื่น ๆ ในระดับภูมิภาค

ขอบข่าย

มาตรฐานผลิตภัณฑ์อุตสาหกรรมนี้ให้แนวทางสำหรับทุกองค์กร โดยเฉพาะองค์กรขนาดกลางและขนาดย่อม สำหรับการพัฒนา การนำไปปฏิบัติ การรักษา และการปรับปรุงระบบการจัดการสิ่งแวดล้อมอย่างเป็นขั้นตอน รวมถึงคำแนะนำในการบูรณาการและการใช้เทคนิคการประเมินผลสมรรถนะด้านสิ่งแวดล้อม

มาตรฐานผลิตภัณฑ์อุตสาหกรรมฉบับนี้ประยุกต์ใช้ได้กับทุกองค์กร โดยไม่คำนึงถึงระดับของการพัฒนา ลักษณะของกิจกรรมที่ดำเนินการ หรือที่ตั้ง

บทนิยาม

รายละเอียดให้เป็นไปตามมาตรฐาน ISO 14005 : 2010 ข้อ 2

กระบวนการนำไปปฏิบัติอย่างเป็นขั้นตอน

รายละเอียดให้เป็นไปตามมาตรฐาน ISO 14005 : 2010 ข้อ 3

การดำเนินการโครงการด้านสิ่งแวดล้อมเพื่อให้มั่นใจในการสนับสนุนและความมุ่งมั่นของฝ่ายบริหาร เพื่อเริ่มต้นในการนำระบบการจัดการสิ่งแวดล้อมไปปฏิบัติอย่างเป็นขั้นตอน

รายละเอียดให้เป็นไปตามมาตรฐาน ISO 14005 : 2010 ข้อ 4

องค์ประกอบที่สนับสนุนการนำไปปฏิบัติและการรักษาระบบการจัดการสิ่งแวดล้อม

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การพัฒนาและการนำระบบการจัดการสิ่งแวดล้อมไปปฏิบัติ

รายละเอียดให้เป็นไปตามมาตรฐาน ISO 14005 : 2010 ข้อ 6

ภาคผนวก

รายละเอียดให้เป็นไปตามมาตรฐาน ISO 14005 : 2010 Annex A ถึง Annex E

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 14005 was prepared by Technical Committee ISO/TC 207, *Environmental management*, Subcommittee SC 1, *Environmental management systems*.

Introduction

The purpose of this International Standard is to encourage and guide organizations, especially small- and medium-sized enterprises (SMEs), to develop and implement an environmental management system (EMS) that meets the requirements of ISO 14001. The guidance does not go beyond ISO 14001, except for the inclusion of environmental performance evaluation and is not intended to be used for the interpretation of ISO 14001 nor for certification purposes.

Many organizations have profited from having a formal environmental management system. But many more organizations, especially SMEs, do not have such a system, even though it could benefit them greatly. This International Standard uses a phased approach to implement an environmental management system that can grow, to meet the requirements of the International Standard for environmental management systems, ISO 14001.

A phased approach offers several advantages. Users can readily evaluate how the time and money put into an EMS provides a return. They can see how environmental improvements help to reduce costs, improve their community relations, assist them in demonstrating compliance with legal and other requirements, and help them live up to customer expectations. They can track the benefits of their EMS while they implement their system step by step, adding or expanding elements as they provide value to the organization. When the scope of the EMS includes all of the organization's activities, products and services that it wishes to cover and these are addressed using all the elements of this International Standard to their full extent, the organization would have developed and implemented a system that meets the requirements of ISO 14001.

ISO 14001, the most widely accepted international EMS standard, is a structured approach to managing an organization's environmental matters. It is consistent with, and forms the basis of, many other regional management system approaches.

Environmental management systems — Guidelines for the phased implementation of an environmental management system, including the use of environmental performance evaluation

1 Scope

This International Standard provides guidance for all organizations, but particularly small- and medium-sized enterprises (SMEs), on the phased development, implementation, maintenance and improvement of an environmental management system. It also includes advice on the integration and use of environmental performance evaluation techniques.

This International Standard is applicable to any organization, regardless of its level of development, the nature of the activities undertaken or the location at which they occur.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1
auditor
person with the competence to conduct an audit

[ISO 14050:2009, 5.31.1]

2.2
audit findings
results of the evaluation of the collected audit evidence against audit criteria

NOTE Audit findings can indicate either conformity or nonconformity with audit criteria or opportunities for improvement.

[ISO 14050:2009, 5.23]

2.3
audit programme
set of one or more audits planned for a specific time frame and directed towards a specific purpose

NOTE An audit programme includes all activities necessary for planning, organizing and conducting the audits.

[ISO 1450:2009, 5.32]

2.4
continual improvement
recurring process of enhancing the environmental management system in order to achieve improvements in overall environmental performance consistent with the organization's environmental policy

NOTE The process need not take place in all areas of activity simultaneously.

[ISO 14050:2009, 4.7]

2.5
corrective action
action to eliminate the cause of a detected nonconformity

[ISO 14050:2009, 4.4.2]

2.6
document
information and its supporting medium

NOTE 1 The medium can be paper, magnetic, electronic or optical computer disc, photograph or master sample, or a combination thereof.

NOTE 2 Adapted from ISO 9000:2005, 3.7.2.

[ISO 14050:2009, 4.5]

2.7
environment
surroundings in which an organization operates, including air, water, land, natural resources, flora, fauna, humans and their interrelation

NOTE Surroundings in this context extend from within an organization to the global system.

[ISO 14050:2009, 3.1]

2.8
environmental aspect
element of an organization's activities or products or services that can interact with the environment

NOTE A significant environmental aspect has or can have a significant environmental impact.

[ISO 14050:2009, 3.2]

2.9
environmental impact
any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects

[ISO 14050:2009, 3.3]

2.10
environmental management system
EMS
part of an organization's management system used to develop and implement its environmental policy and manage its environmental aspects

NOTE 1 A management system is a set of interrelated elements used to establish policy and objectives and to achieve those objectives.

NOTE 2 A management system includes organizational structure, planning activities, responsibilities, practices, procedures, processes and resources.

[ISO 14050:2009, 4.1]

2.11
environmental objective
overall environmental goal, consistent with the environmental policy, that an organization sets itself to achieve

[ISO 14050:2009,4.1.2]

2.12
environmental performance
measurable results of an organization's management of its environmental aspects

NOTE In the context of environmental management systems, results can be measured against the organization's environmental policy, environmental objectives, environmental targets and other environmental performance requirements.

[ISO 14050:2009, 3.16]

2.13
environmental performance evaluation
EPE
process to facilitate management decisions regarding an organization's environmental performance by selecting indicators, collecting and analysing data, assessing information against environmental performance criteria, reporting and communicating, and periodically reviewing and improving this process

[ISO 14050:2009, 3.16.1]

2.14
environmental performance indicator
EPI
specific expression that provides information about an organization's environmental performance

[ISO 14050:2009, 3.16.4]

2.15
environmental policy
overall intentions and direction of an organization related to its environmental performance as formally expressed by top management

NOTE The environmental policy provides a framework for action and for the setting of environmental objectives and environmental targets.

[ISO 14050:2009, 4.1.1]

2.16
environmental target
detailed performance requirement, applicable to the organization or part thereof, that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives

[ISO 14050:2009, 4.1.3]

2.17
interested party
person or group having an interest in the performance or outcome of an organization or a system

NOTE 1 “Outcome” includes products and agreements. “System” includes product systems and environmental labelling and declaration systems.

NOTE 2 This generic definition is not taken directly from any other document. The concept is defined specifically from the point of view of environmental performance in ISO 14001 (with identical definition in ISO 14004 and ISO 14031), type I environmental labelling in ISO 14024, type III environmental declaration in ISO 14025, and life cycle assessment in ISO 14040.

[ISO 14050:2009, 3.6]

2.18
internal audit
systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which the environmental management system audit criteria set by the organization are fulfilled

NOTE In many cases, particularly in smaller organizations, independence can be demonstrated by the freedom from responsibility for the activity being audited.

[ISO 14050:2009, 5.18.1]

2.19
management performance indicator
MPI
environmental performance indicator that provides information about the management efforts to influence an organization's environmental performance

[ISO 14050:2009, 3.16.5]

2.20
nonconformity
non-fulfilment of a requirement

[ISO 14050:2009, 4.3]

2.21
operational performance indicator
OPI
environmental performance indicator that provides information about the environmental performance of an organization's operation

[ISO 14050:2009, 3.16.6]

2.22
organization
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

NOTE For organizations with more than one operating unit, a single operating unit may be defined as an organization.

[ISO 14050:2009, 3.4]

2.23
phased implementation
any combination of steps, that can be delivered in a sequential way, to fulfil the requirements of an EMS and as determined by the user to suit their needs and resources

2.24
preventive action
action to eliminate the cause of a potential nonconformity

[ISO 14050:2009, 4.4.3]

2.25
prevention of pollution
use of processes, practices, techniques, materials, products, services or energy to avoid, reduce or control (separately or in combination) the creation, emission or discharge of any type of pollutant or waste, in order to reduce adverse environmental impacts

NOTE Prevention of pollution can include source reduction or elimination, process, product or service changes, efficient use of resources, material and energy substitution, reuse, recovery, recycling, reclamation and treatment.

[ISO 14050:2009, 3.11]

2.26
procedure
specified way to carry out an activity or a process

NOTE Procedures can be documented or not.

[ISO 14050:2009, 4.2]

2.27
record
document stating results achieved or providing evidence of activities performed

[ISO 14050:2009, 4.6]

3 Phased implementation process

3.1 General

An organization may decide to apply a systematic approach to managing its environmental aspects in order to solve an individual problem or capitalize on a specific opportunity. Alternatively, the organization may seek to implement an environmental management system (EMS) that enables it to manage its full range of environmental aspects, in order to meet the requirements of ISO 14001.

There are many potential benefits to be gained by an organization from managing its environmental aspects. However, organizations can be deterred from applying a systematic approach to environmental management, if they perceive this as being an inflexible, limiting, bureaucratic or costly process. They can also be overwhelmed by the apparent size of the task.

The model outlined in this International Standard has been developed to help an organization to implement an EMS in a particular way, while growing the extent and scope of the system, through time, in line with the objectives of the organization and the resources available.

Before implementing a phased approach, an organization may need to consider:

— its size;

— its location;

— existing management structures;

— the extent to which environmental issues have been incorporated into day-to-day operational activities;

— cultural needs and aspirations;

— staff availability and expertise;

— limitation of resources.

3.2 Importance of support, commitment and involvement from management and staff

In order to successfully implement an effective EMS which adds value to the organization's activities, it is essential to ensure and maintain support, commitment and involvement from management, including top management and staff. If this is not the case in a particular organization, Clause 4 outlines a possible approach that can be applied to gain sufficient support and commitment to begin implementing an EMS.

More usually, support and commitment grow as people become more involved in the process and begin to benefit from the rewards that can come from managing their environmental aspects.

— high raw material or energy costs which require reduction;

— improvements in pollution control measures which can possibly enhance relations with local communities or customers.

The number of environmental aspects considered and the extent to which they are addressed or resolved may be progressively increased as tangible benefits are secured and additional resources are made available.

4.2 Methodology

4.2.1 General

The steps described in this subclause represent the basic constituents of an EMS. They follow the “Plan-Do-Check-Act” (PDCA) management model:

— P = Plan: identify and select a project and prepare a preliminary environmental action plan;

— D = Do: implement the action plan, including assigning roles and responsibilities;

— C = Check: monitor, measure and evaluate the achievements;

— A = Act: review the process and decide on further action in a management review.

The PDCA model is also used as the basis for a number of other management system standards.

4.2.2 Involvement of top management

It is essential to obtain the involvement, commitment and support of people within the organization who have the authority to ensure that action is taken and who have control over the resources needed to support the successful implementation of the EMS. The term “top management” is often used to describe these people. These people should understand the importance of their commitment and support, which should be additionally communicated to others within the organization.

Top managers should appoint a project leader who acts as a focal point for their environmental project. When implementing an EMS that meets the requirements of ISO 14001, this person is known as the management representative. For the purposes of the guidance given in this International Standard, the term “management representative” is also used to mean “project leader”, depending upon whether it is a matter of implementing a fully ISO 14001-compliant EMS or a smaller scale environmental project.

4.2.3 Identification and selection of a project

In deciding which environmental project(s) might generate environmental improvements and business benefits that would encourage commitment and support, it can be helpful to collect information on a wide range of environmental issues facing the organization. These can include regulatory compliance, environment-related complaints (e.g. smoke, noise, odours), obvious negative impacts on the environment (e.g. air or water pollution), costs associated with energy, waste, water and raw materials use, requests from customers, suggestions from staff or the views of other or interested parties.

The selected project should be of sufficiently limited scope to be manageable with limited resources, but also to be able to produce demonstrable value to the organization within a reasonable period of time, in order to secure support for further environmental projects or the implementation of a full EMS.

Attention should be given to the level of effort required, resources and return on investment, including potential benefits and opportunities. The selected project with its defined scope, expected benefits, necessary budget and potential downsides should be submitted to top management in order to secure its approval.

3.5 The phased implementation process of an EMS

It may be useful for an organization that is uncertain as to which approach might be best, to undertake a single project, as indicated in Clause 4, as a starting point to understanding and applying a systematic approach to environmental management.

The following two different approaches to the phased implementation of an EMS are suggested in this International Standard:

a) using fixed steps to follow a progression of elements (see Clauses 5 and 6). This approach can suit organizations, which after carrying out an initial environmental project (see Clause 4), decide to adopt this structured approach to managing their environmental aspects (see example in Annex B);

b) using a selection of steps that may be implemented consecutively or concurrently to meet the specific requirements of ISO 14001. This selection of steps may be chosen to address specific environmental issues, such as demonstrating legal compliance, meeting the needs of interested parties, such as a customer requirement, or improving environmental performance. This approach may suit organizations that wish to grow at their own pace and within the resources available to them to make their EMS more effective (see example in Annex C).

An implementation plan should be developed that identifies the:

— approach to be adopted;

— timescale in which it should be achieved;

— resources required;

— roles and responsibilities of those implementing the plan;

— records required;

— methods by which progress can be consistently monitored and measured.

Progress can be measured in terms of achievement of the implementation outcomes specified at the end of each phase and compliance with the implementation plan. The phased implementation process also enables the organization to evaluate its progress towards implementing ISO 14001. Measuring progress towards implementing an EMS is useful to ensure the efficient use of resources and achieve the organization's objective.

4 Undertaking an environment-related project to secure management support and commitment to begin the phased implementation of an EMS

4.1 Purpose

Before starting to implement an EMS and in order to secure new, or strengthen existing commitment, an organization may find it helpful to run a limited scope project. This would provide familiarity with the basic constituents of an EMS, experience of some of the benefits of managing environmental aspects in a systematic way and help improve environmental performance.

This may be done by considering a small project focusing on just one or a limited number of environmental aspects of particular and immediate interest to the organization, for example:

— specific waste stream for which disposal is costly or difficult;

— regulatory requirements which have to be addressed;

— high raw material or energy costs which require reduction;

— improvements in pollution control measures which can possibly enhance relations with local communities or customers.

The number of environmental aspects considered and the extent to which they are addressed or resolved may be progressively increased as tangible benefits are secured and additional resources are made available.

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The selected project should be of sufficiently limited scope to be manageable with limited resources, but also to be able to produce demonstrable value to the organization within a reasonable period of time, in order to secure support for further environmental projects or the implementation of a full EMS.

Attention should be given to the level of effort required, resources and return on investment, including potential benefits and opportunities. The selected project with its defined scope, expected benefits, necessary budget and potential downsides should be submitted to top management in order to secure its approval.

4.2.4 Planning and implementation of the selected project

Before starting work on the selected project, it is good practice to prepare an action plan. This may be very short, especially for small organizations, but it should at least briefly outline what the project is intended to deliver, why this will be of value to the organization and how it can be achieved. The plan may also include expected costs.

It may start by conducting a review in order to identify and analyse:

a) the main legal environmental requirements applicable to the organization's activities, products and services included in the scope of the project. Some consideration may also be given to other requirements (e.g. contractual requirements);

b) the main impact(s) on the environment of its activities, products and services. In doing so, the organization may examine permits issued by authorities and information available from trade associations concerning discharges to air, water, and land, handling and disposal of waste, the use and production of harmful substances, and the consideration of the views of interested parties.

It is not expected that the review be exhaustive, but it should be thorough and focus on key elements in order to provide a reliable assessment of the value that an EMS could add to the organization.

It may be necessary to perform some quantitative evaluation of the environmental aspects and their associated costs, where such information does not already exist (e.g. mass of waste, volumes of liquid effluents, money lost due to potentially recoverable products being discarded or sent for waste disposal, number of complaints, composition of the effluents). These values are called performance indicators; it is practicable to express them per level of activity (e.g. mass of finished product).

NOTE Further explanations of how performance indicators can be used are included in 6.8.

Following the identification of performance indicators, objectives and targets for improvement should be identified, for example the reduction in the use of energy and the decrease of harmful discharges. Objectives and targets should be quantified as much as possible and should be linked to appropriate indicators as described above. A prioritization of objectives and targets is necessary, taking into consideration business operations, available resources, goals of management and other issues concerning the organization.

The associated action plan should eventually define:

— the actions necessary to reach these objectives and targets;

— the corresponding resources (human and financial);

— timescales, in particular a precise time limit should be set for the completion of the project;

— adequate responsibilities for its implementation.

The project action plan should be submitted to top management for approval.

Responsibilities should be assigned to specific persons in the organization and adequate resources provided according to the specifications of the action plan. All the actions included in the plan should be implemented and additional training may be required to effectively achieve some of them.

4.2.5 Checking the selected project

Progress against the chosen indicators may be assessed periodically with the personnel involved in operational activities included in the project in order to determine:

— progress with respect to performance indicators;

— resources and expenditure;

— potential delays;

— other deviations from the action plan.

Appropriate action should be taken, if necessary, to ensure that the project progresses according to plan.

4.2.6 Reviewing the selected project

When the action plan has been fully implemented, top management should review the process and the results to examine and evaluate:

— whether all of the planned actions have been adequately implemented;

— whether improvements in environmental performance have been achieved;

— the level of achievements made against the planned goals;

— the financial outcomes;

— the possible consequences for the organization's structure;

— other costs and benefits of the project, including possible reactions of interested parties.

The management representative in charge of the project should prepare a summary report, taking into consideration the points described above.

At the end of the review, having increased their understanding, top management should be in a position to decide whether to proceed with the implementation of a full EMS. Alternatively, they may decide to expand the current project (e.g. modifications of the action plan, better communication, allocation of additional resources, new assignment of responsibilities and changes in the scope) or start an additional project focusing on another environmental aspect.

If the organization decides to continue with implementation of an EMS that meets the full requirements of ISO 14001, top management should formally express its commitment and support and take all the measures necessary for the implementation of the actions described in the following text, including designation of a management representative and the allocation of sufficient time and resources. In any case, top management should clearly communicate and explain its decision to all personnel within the organization.

For an example of a working EMS project, see Annex D.

5 Elements that support the implementation and maintenance of an EMS

5.1 Environmental communications

5.1.1 General

If an environmental improvement action or the implementation of a management system is to be effective, those involved in its use should own and support it. Furthermore, the better they understand why they should provide support and the sooner they get feedback on what has been achieved, the better motivated they will be. There is a need for an effective and regular flow of information between management and staff to provide not only direction, but also updates on progress. In addition, there should be good communication between the affected areas of the organization, such that each understands the environmental implications that their actions may have on others in the organization.

It is also important that good two-way communication be established and maintained with customers, communities and other external interested parties. Listening to the concerns, views and ideas of those outside the organization can help to build trust and can even lead to improved business and access to markets. As the environmental objectives and targets are developed and the management system matures, involving interested parties can help the organization understand, address and be responsive to external views before they become issues.

The decisions as to what should be communicated, to whom and how, should be undertaken in a planned way.

Step 1	Step 2	Step 3	Step 4	Step 5
Recognize the need and value of communicating on environmental issues.	Identify what will be communicated and to whom.	Plan how information will be communicated with interested parties.	Implement the communication process.	Monitor the results of communications to determine if they have been effective.

5.1.2 Step 1

The organization should recognize the importance of communicating on environmental issues to ensure the effective implementation of an environmental management system. This includes communicating internally within the organization and with external interested parties. Identifying examples of where poor communication has caused difficulties for the organization, or where good communication has delivered benefits, is a good way to start developing a communication strategy. Additional information regarding environmental communication can be found in ISO 14063.

5.1.3 Step 2

The organization should identify and determine what information is needed and to whom it should be communicated. This information may include:

— the organization's environmental policy, the extent and scope of its significant environmental aspects, objectives and targets for improvement in environmental performance, current levels of environmental performance and compliance with legal requirements;

— any feedback received from internal and external interested parties (including complaints, regulatory compliance audits and customer questionnaires);

— other relevant information required to ensure the effective implementation of an EMS.

The organization should decide on the target audience, which includes its internal and external interested parties. It should ensure that there is a two-way communication mechanism internally between management and staff, and externally with interested parties, such as customers, communities and authorities. The organization should decide on the communications that are important for each audience, i.e. delivering a message, seeking input and support or regulatory approval.

5.1.4 Step 3

Many organizations already have in place methods of communicating with their staff, community, customers, suppliers and other interested parties. Where this is not the case, they may need to create a new communication plan. However, it is usually most cost-effective to build on existing methods, where this is practicable. This is also a good time to assess the effectiveness of the existing plans and to improve them by identifying more effective communication methods or styles.

In order to maintain consistency, communication procedures should be developed and implemented by the organization. These need not be complex, but should outline what should be communicated, to whom, how and for what purpose. Communication procedures should:

— decide how proactive to be with each audience for each type of communication;

— develop key messages (including information/feedback that is being sought), set targets, objectives and performance indicators;

— assign responsibilities and establish a timetable;

— develop a procedure for receiving, documenting and responding to relevant communications from external parties, such as neighbours and regulatory bodies, and communicate the procedure internally.

Methods used for communicating can include: minutes of meetings, bulletin board postings, internal newsletters, suggestion boxes/schemes, websites, electronic mail, informal discussions, organization open days, focus groups, community dialogue, involvement in community events, press releases, advertisements and periodic newsletters, annual (or other periodic) reports and telephone hotlines.

The communication methods chosen by the organization may vary depending upon its size and available resources.

5.1.5 Step 4

At this stage, the organization should provide evidence that:

— communication on environmental issues occurs throughout the organization, as appropriate;

— responses to external questions are addressed in line with its procedure(s) and acted upon;

— if necessary, methods for external environmental communication have been developed.

5.1.6 Step 5

The organization should review its communication with its internal and external interested parties to identify the effectiveness of the communication and take action to adjust the approach taken as necessary (see example in Figure 1).

A small engineering company recently implemented an EMS and wants to communicate the message to their various interested parties, but recognizes that each of them may require different types of information as follows:

Internal interested parties

- *Board members require information on environmental performance and progress of the EMS.*
- *Managers need to know about performance evaluation and future objectives and targets.*
- *Staff and contractors require detailed work instructions and procedures to ensure performance criteria are met and future targets are recognized.*

External interested parties

- *Local communities are concerned about noise and light pollution; this information was communicated to site managers.*
- *Investors and insurers want to know about current legal and other requirements, and about all risks associated with the company's activities, products and services.*
- *Clients want information about the EMS and the life cycle impacts associated with various products.*

The company decides to use a variety of communication techniques to communicate the message:

- *a website with details of their environmental policy and performance is compiled into an environmental report (see below);*
- *an e-mail containing detailed work instructions and related environmental regulations is sent to targeted individuals and contractors;*
- *posters to explain its commitment to improve environmental performance and why this is important;*
- *consultation meetings with residents to discuss local concerns and to explain the organization's commitment to environmental protection.*

To support its communication strategy, the company also produced an environmental report, which included the following information:

- *explanation of their environmental policy and future strategy;*
- *inventory of environmental aspects and related impacts of activities, products and services;*
- *list of relevant environmental legislation and regulations;*
- *data from environmental performance evaluation and related indicators;*
- *details of those who have responsibility for the EMS and other environmental roles;*
- *summary of environmental performance, including:*
  - *progress on meeting policy aims,*
  - *objectives and targets being met, and*
  - *outstanding issues, including nonconformance.*

This report was signed by the Chief Executive and published on the company's website.

NOTE The organization can decide to produce an externally validated environmental statement. Whilst this is not a requirement of ISO 14001, it is one example of good communication practice.

Figure 1 — Example — SME environmental communication strategy

5.2 Resources, roles, responsibility and authority

5.2.1 General

Roles, responsibilities and authorities should be clearly defined so they are not misunderstood. Resources should also be defined. This is important so that management understands the resource implications of the environmental commitments and that those who are charged with providing the resources are also committed.

Individual responsibilities should be clearly defined, so there is no misunderstanding, such as duplication of effort or missed tasks.

Step 1	Step 2	Step 3	Step 4
Recognize the need to have defined resources, roles, responsibilities and authority of top management of the organization and of implications of the EMS.	Identify and define the roles, responsibilities and appropriate resources within the organization.	Appoint a specific management representative for the EMS.	Communicate the roles and responsibilities to all those affected and ensure that they understand and agree with them. Assign the resources as needed.

5.2.2 Step 1

The top management of the organization should understand that it is important for effective implementation of the EMS that all roles, responsibilities, authority and resource needs be recognized.

5.2.3 Step 2

Responsibilities should be job-specific, wherever possible, and should be documented. This is often accomplished through job descriptions. Another way may be specific role and responsibility descriptions with regard to environmental protection (for example making someone a management representative, project leader or assigning them another specific environmental role). Formalizing key roles, responsibilities and authorities within the organization requires agreement that the existing assignments are correct and also expanding them to include environmental issues. The allocation of resources should take account of the activities, timetables and milestones of the programme.

5.2.4 Step 3

In order to meet the requirements of ISO 14001, top management is required to appoint a “management representative” who ensures that the environmental management system is established, implemented and maintained and who reports on progress to top management. It is possible that a top manager may take on the role of management representative. It is critical that the individual assigned be able to give the management system adequate priority relative to the person's other responsibilities and that he/she has the authority to implement necessary actions.

5.2.5 Step 4

After defining the roles, responsibilities and authorities, these should be communicated to the entire organization. The individuals involved should be committed to achieving the objectives and targets; the functional areas should have the time, financial support and technical ability to fulfil their commitments and complete any required training.

5.3 Competence, training and awareness

5.3.1 General

Environmental awareness among personnel (including employees and contractors) of the organization is crucial for implementing an effective EMS. It is necessary for the organization to ensure that personnel who carry out activities, which can significantly impact upon the environment, are competent to do so. This may require additional training.

Step 1	Step 2	Step 3	Step 4
Recognize the need to have competent personnel in the organization and awareness of implications of the EMS.	Determine the competence required for carrying out activities that relate to the organization's significant environmental impacts. Develop and implement an awareness procedure.	Develop and implement a training programme, as necessary. Assess competence against the requirements and ensure that they are met.	Maintain the competence, training and awareness programme.

5.3.2 Step 1

The organization should recognize that personnel who are not competent might not carry out their tasks effectively.

5.3.3 Step 2

The organization should identify what competencies are needed to carry out the tasks required by personnel within the EMS. This can be achieved in a number of ways, including:

— carrying out a training-needs analysis;

— carrying out a competence assessment;

— benchmarking competence against industry standards and professional qualifications.

In order to focus efforts on minimizing risk to the environment and the organization, it is helpful to start by looking at significant aspects and legal requirements. The organization should develop and implement an awareness procedure in order to ensure that all of those working for and on behalf of the organization are aware of the impacts of their actions on the environment.

5.3.4 Step 3

The training programme should provide a range of training which is relevant to personnel roles and job functions. It should be delivered in such a way that they understand what they should do and why this is beneficial to themselves, the organization and the environment. The plan may include a range of techniques, including formal training, on-the-job guidance and assessment and mentoring by colleagues. It also requires the allocation of resources and responsibilities.

The demonstration of required competence should be based on achieved training, education or experience. The organization should provide training for the personnel in relation to both the EMS itself and the organization's significant environmental aspects. It is particularly important to ensure that personnel understand why it is important to the organization that actions are carried out in a particular way, in order to prevent or reduce harm to the environment. Records of training activities and demonstration of competence should be maintained.

In addition, it is important to remember that environmental aspects should be included in the induction of new staff, site visitors and contractors.

5.3.5 Step 4

The organization should collect feedback from personnel regarding the training and competence development and assessment techniques used in order to monitor effectiveness. In addition, it is important to remember that periodic re-training and assessment can help to maintain competence at a suitable level.

5.4 Records

5.4.1 General

Some records are prescribed in both format and retention time by legal and other requirements, but most records are created and kept at the discretion of the organization. Since the organization may be required to demonstrate implementation of its environmental management to external interested parties, those records should be maintained in a legible, accessible form.

Step 1	Step 2	Step 3
Recognize the need to maintain records as evidence of its ongoing EMS.	Determine which records are required and establish an implemented procedure for their control.	Review and maintain records as necessary.

5.4.2 Step 1

The organization should recognize that records provide the evidence that the environmental management system is functioning, and that they should be protected and can be retrieved when needed.

5.4.3 Step 2

It is likely that an organization is already keeping some records related to environmental aspects. These should be reviewed against the legal and other requirements, objectives and targets, and operational controls to ensure that there are adequate records to demonstrate compliance with requirements and conformity to the EMS. Records include log books with dated and signed notations of activities, equipment charts tracking particular data over time, lists of waste shipped offsite, notes or minutes of meetings.

The organization should determine what records are to be maintained, and establish and implement a procedure to define how they will be maintained and how they will be disposed of. This procedure should also define how the records will be removed after the specified storage time.

5.4.4 Step 3

Records that are required to demonstrate conformance with the EMS should be collected, reviewed and maintained.

They should be reviewed against the legal and other requirements, objectives and targets, and operational controls to ensure that they are adequate to demonstrate compliance with requirements and conformity to the EMS.

5.5 Documentation

5.5.1 General

Documentation is the principal source of reference for an organization's EMS.

Step 1	Step 2	Step 3	Step 4
Within the scope of the EMS, recognize the need to have documentation.	Determine which documentation is needed.	Prepare and organize documentation.	Implement documentation.

5.5.2 Step 1

The organization should recognize that documentation helps to ensure that activities which present a risk to it are controlled in a consistent way. In addition, the organization can demonstrate what decisions it has made, upon what information and circumstances these decisions were based, how any necessary actions were carried out (including by whom) and that they were trained and competent to do so, and the results of those actions.

The extent to which documentation is required and the form that it takes depends upon the needs of the individual organization. Some organizations, especially SMEs, can have limited need for documentation or may already have a well-established method for documenting environment-related business activities and decisions.

5.5.3 Step 2

For an EMS to comply with the requirements of ISO 14001, some of the activities that it carries out should be defined in procedures. These procedures may be documented or not, according to the needs and practices of the organization. Those that the organization decides to document may be in different forms, such as: simple pictures, flow diagrams, photographs, signposts or written documents.

5.5.4 Step 3

When implementing an EMS, it is helpful, but not necessary, to prepare a manual outlining the structure of the EMS. An environmental manual does not need to be large, nor does it need to be in paper form; the format of the document depends upon the needs of the organization. Electronic manuals held on an organization's intranet are becoming increasingly common. It is, however, important that the manual be appropriate to the needs of the organization and that it be accessible to and used by those involved in the implementation of the EMS.

5.5.5 Step 4

Once a document has been approved, the relevant management level should put it into practice.

5.6 Document control

5.6.1 General

Appropriate control of documents is essential for maintaining a properly functioning EMS.

Step 1	Step 2	Step 3	Step 4
Within the scope of the EMS, recognize the need to have control of documentation.	Develop a procedure for the control of the documentation.	Prepare and organize documentation control.	Implement and maintain control of documents.

5.6.2 Step 1

The organization should recognize that control of its documents helps to ensure the correct documents are used and that the content of the documents is kept updated.

5.6.3 Step 2

A procedure is required, which outlines how the organization controls documents within the EMS. The organization should establish, implement and maintain a procedure(s) to:

a) approve documents for adequacy prior to issue;

b) review and update, as necessary, and re-approve documents;

c) ensure that changes and the current revision status of documents are identified;

d) ensure that relevant versions of applicable documents are available at points of use;

e) ensure that documents remain legible and readily identifiable.

5.6.4 Step 3

Control procedures may differ between documents. Internal documents generated by the organization (such as documented procedures, drawings, materials specifications, emergency plans, training and programmes) should be controlled in such a way as to ensure that only approved copies are available to personnel for use. For external documents, such as legal and other requirements, it is important to identify the origin of documents and to ensure that revisions are obtained and distributed promptly to those who need them.

5.6.5 Step 4

Once a document has been approved, it should be communicated to those who will apply it.

6 Development and implementation of an EMS

6.1 Identification of the organization's significant environmental aspects

6.1.1 General

Any organization that performs activities, delivers products and provides services, interacts with the environment. Identifying the ways in which its activities, products and services can interact with the environment (known as the organization's “environmental aspects”) and determining which of these are the most important (significant) are essential steps in establishing an EMS. They help the organization to focus its resources and efforts on actions that eliminate or at least minimize any adverse impacts and accentuate beneficial impacts. Managing environmental aspects not only provides significant environmental improvement, but can also generate financial and other commercial benefits.

Step 1	Step 2	Step 3	Step 4
Recognize that the organization's activities, products and services interact with the environment.	Develop and implement a procedure to identify the organization's environmental aspects (see 3.4 for scope of the EMS).	Develop and implement a procedure to determine those aspects that have, or can have significant impact(s) on the environment.	Compile and keep an up-to-date list of significant aspects.

6.1.2 Step 1

Recognition that an organization interacts with the environment can be prompted by external pressures, such as regulatory bodies, customers or neighbours. Alternatively, this recognition may be gained through action taken within the organization which could include collecting and evaluating information using the process defined in Clause 4.

6.1.3 Step 2

The identification of aspects and impacts should involve those people in the organization who are familiar with its activities, products and services. Consideration should be given to how products are made, used and disposed of and how services are delivered. If there is insufficient information available within the organization, information from external sources, such as trade associations, regulatory agencies, suppliers, publications/the Internet or consultants can be sought.

To plan for controlling its environmental aspects, an organization should know what these aspects are and to which impacts they are linked. Discharges to water, emissions to air, releases to land, and use of energy and water are examples of environmental aspects. It is important to note that the way some equipment or processes can impact on the environment can change at times, such as start-up, shutdown or malfunction. It is therefore necessary to consider these abnormal operating conditions as well as normal operating conditions and the impacts associated with potential emergency situations.

Tools, such as cause-and-effect diagrams or flowcharts illustrating inputs and outputs from processes, can be useful. It is also helpful to have a site plan upon which the boundary of the site can be marked, along with other key features, such as effluent discharge points, the location of pipework and services, chimneys and boiler houses, the locations where hazardous materials are stored and so on. Whilst this is not a requirement of ISO 14001, some organizations may find it useful to use eco-design criteria and life cycle analysis in order to help them identify their environmental aspects.

An organization is only expected to address those aspects which it can control and those that it can influence. For example, while an organization probably has control over how much electricity it buys from a supplier, it may not have control or influence over the way in which that electricity is generated. While an organization cannot control how a consumer disposes of their product, they may be able to influence that consumer by providing instructions on handling and disposal.

The organization should develop and implement a procedure to identify the environmental aspects related to:

— past activities on the site;

— its current activities, products and services;

— its day-to-day operations, including any abnormal circumstances;

— potential and actual emergency situations that the organization might have to face;

— new or modified projects undertaken by the organization.

Aspects can cause, or have the potential to cause, changes in the environment, i.e. environmental impacts. These impacts can be either beneficial (e.g. increasing biodiversity) or adverse (e.g. killing fish by discharging toxic materials into a stream, depleting natural resources). Information from any permits/licences, existing monitoring data and past environmental incidents or readily available from regulatory agencies can be used to assist in the identification of the associated impacts.

An organization should record its aspects and their associated impacts. That may be made in a database, register or list.

6.1.4 Step 3

Determining which of the organization's aspects are significant enough to need managing should involve those people in the organization who are familiar with the environmental aspects associated with these impacts. External experts, regulatory agencies, trade associations and other external sources can also be helpful in this process.

A procedure that gives repeatable and consistent results should be used to determine which of the organization's environmental aspects are significant. Complex analysis and measurements are typically not necessary for SMEs; a simple process of ranking could be used.

The method should also address how the concerns of internal or external parties, such as organizational values, public image, employee concerns or views of neighbours and community members and/or legal requirements are incorporated into deciding what is significant. Other criteria can include duration, frequency and severity of environmental impacts, the likelihood of them occurring, the potential consequences and the extent to which controls are already in place to deal with these impacts.

A method of keeping information on the organization's environmental aspects and their significance up-to-date is necessary. The method may be refined in the future as the organization gains experience and expertise in environmental management.

The procedure developed in this step may be combined with the procedure developed in the previous step for the identification of environmental aspects.

Examples of methods for determining those aspects that have, or can have, significant impact(s) on the environment are shown in Table 1. There is not a unique way to determine what aspects are significant. In principle, the determination can be based on defined criteria, expert knowledge and experience, and/or the use of a consistent methodology.

Table 1 — Examples of methods for determining those aspects that have, or can have, significant impact(s) on the environment

Principle of determination	Example
Criteria	Criteria for significance may be chosen based on environmental considerations, such as scale, severity and duration of the impact or type, size and frequency of an environmental aspect; legal requirements, such as emission and discharge limits in permits or regulations, the concerns of internal and external interested parties such as those related to organizational values, public image and community or employee concerns, such as noise, odour or visual degradation.
Environmental knowledge and experience	The organization should involve people who are competent with regard to environmental issues. If competent persons are not available in the organization, it may seek help from outside entities, such as trade associations, local regulatory agencies, universities, NGOs and other outside competent entities.
Consistent methodology	It is important to use a consistent and repeatable routine but complex analysis and measurements may not be necessary for SMEs.

6.1.5 Step 4

Significant environmental aspects should be taken into account when establishing, implementing and maintaining the environmental management system, for example implementing controls to reduce impacts, training staff and establishing plans to respond to accidents/incidents.

6.2 Identification of the organization's legal and other requirements

6.2.1 General

Identifying all relevant legal and other requirements is essential for any environmental management system. It is important that the organization understand the type and nature of its environmental aspects, determine the legal requirements with which it has to comply in order to meet its obligation to society, ensure legal compliance, prevent prosecution, avoid fines and maintain or improve its image. Because legal requirements vary from country to country, they are unique to each organization and site. Other requirements to which the organization may subscribe can include non-binding protocols, voluntary agreements and/or codes of practice.

Step 1	Step 2	Step 3	Step 4
Recognize that the organization may need to comply with legal and other requirements that relate to its environmental aspects.	Identify relevant legal and other requirements.	Determine how the legal and other requirements apply to the organization's environmental aspects.	Keep an up-to-date understanding of the legal and other requirements which are applicable to the organization.

6.2.2 Step 1

Organizations should recognize that they may have legal requirements based on resource use (such as water and non-renewable energy), product design and prescribed discharge limits for water, air, noise and odours or for installing and/or operating particular equipment, such as boilers and underground tanks, or for the storage of hazardous waste. These may be prescribed by government regulatory bodies in the form of legislation, permits, licences and discharge limits.

Because the potential consequences of not complying with legal requirements can present a threat to the organization's existence (possibly including fines, interruptions to operations, community concern, customer dissatisfaction or contractual disputes), all organizations should know how legal requirements affect their operations and develop plans for complying with them.

The organization may also have other environmental requirements, such as those in supply contracts and those expected by trade associations or other agreements which the organization has made.

6.2.3 Step 2

Organizations should designate competent staff to establish a procedure for identifying legal and other requirements. If there is a lack of internal expertise, it may help to have assistance from external sources with experience in the organization's business and with knowledge of the local/national legal and other requirements. Trade associations, business support networks or the regulatory bodies themselves may be able to provide information regarding relevant legislation.

An organization should document its legal and other requirements in a database, register or list.

6.2.4 Step 3

Those with technical knowledge of the legal and other requirements and how they apply to the organization's activities and environmental aspects should be responsible for determining, communicating and monitoring legal and other requirements to those responsible for the relevant operations, including contractors.

6.2.5 Step 4

Legal and other requirements should be reviewed periodically. The frequency of this review depends on how often changes are likely to occur. Consideration should be given to new or modified requirements or those that may apply if changes in the organization's structure, size or product and service range occur. Relevant information should be communicated to those responsible in a form that they can understand and act upon. This may include establishing or changing operating procedures, monitoring emissions and discharges, or taking other actions to comply.

6.3 Evaluation of compliance with the organization's legal and other requirements

6.3.1 General

Having identified legal and other requirements, it is essential to evaluate how well the organization is complying with them. In order to demonstrate compliance on a continual basis, it will be necessary to establish methods and indicators to measure compliance. Evaluation of compliance is also necessary to demonstrate improvements in performance.

Step 1	Step 2	Step 3	Step 4
Recognize that the organization is subject to legal and other requirements and that it needs to comply with them.	Identify and plan the methods used to monitor and measure compliance.	Periodically evaluate compliance with all legal and other requirements.	Record and report the results of the evaluation, including compliance and/or non-compliance with all legal and other requirements.

6.3.2 Step 1

Top management should be aware of the need for the organization to demonstrate compliance with its legal and other requirements.

6.3.3 Step 2

Organizations should designate competent staff to identify and plan methods for monitoring and measuring compliance. A procedure should be developed in order to evaluate compliance with legal and other requirements. The method requires the identification of indicators necessary to demonstrate compliance with legal requirements. The indicators may be qualitative and/or quantitative.

6.3.4 Step 3

The organization should periodically compare the results of its monitoring and measuring with the values specified in the relevant legal and other requirements, as necessary, using the defined method. The monitoring frequency may be dependent on legal requirements, the results of past compliance, existing controls, or potential impacts on the environment resulting from the breach.

6.3.5 Step 4

Records should be kept to demonstrate compliance and should be reported to relevant interested parties, as necessary, including top management.

NOTE If a nonconformity is detected, action can be taken according to 6.10.

6.4 Preparation and implementation of an environmental policy

6.4.1 General

The environmental policy is a short, public declaration that outlines the intentions, direction and commitments of the organization, with respect to improving its environmental performance.

Step 1	Step 2	Step 3	Step 4
Recognize the need to have an environmental policy for the organization.	Prepare a preliminary environmental policy suitable for the organization.	Finalize the environmental policy document.	Make the environmental policy available to the public. Make all those working for and on behalf of the organization aware of its content and meaning.

6.4.2 Step 1

Using the information gained during the identification of environmental aspects, from activities carried out under either 4.2.2 or 6.1, top management should be able to develop an understanding of how the organization's operations can impact upon the environment, the expectations of regulators, customers, shareholders and other interested parties, and the strategic environmental issues which it should address.

6.4.3 Step 2

Top management should guide the development of the policy, but with input from throughout the organization. Broad participation helps to make the policy appropriate to the organization and ensures that both staff and management are committed to its contents.

In order to meet the requirements of ISO 14001, an environmental policy should:

a) be appropriate to the nature, scale and environmental impacts of its activities, products and services;

b) include a commitment to continual improvement and prevention of pollution;

c) include a commitment to comply with applicable legal and other requirements to which the organization subscribes, which relate to its environmental aspects;

d) provide the framework for setting and reviewing environmental objectives and targets;

e) be documented, implemented and maintained;

f) be communicated to all persons working for or on behalf of the organization;

g) be available to the public.

An organization does not need to prepare a policy which fully reflects these requirements at the first attempt. It is often useful to prepare a preliminary environmental policy as a starting point.

The organization should start by reviewing any environmental policies or commitments that it has already made, even if they were not formalized or written. It may also help to look at the policies of other similar organizations. In addition, attention should be paid to any declarations or commitments made by parent organizations.

For example:

— if recurring complaints are received, a commitment to community involvement can be considered;

— if a history of spills or releases exists, a commitment to restoring the environment may be appropriate.

6.4.4 Step 3

Check that the preliminary environmental policy is still relevant and amend or expand it, as necessary, in the light of any new information that has been gathered since the early drafting stage.

Check that the written content fully complies with the requirements of ISO 14001, as noted in step 2 (see 6.4.3), by cross-checking the content with these requirements and amending as necessary.

The completed environmental policy document should be approved by top management, and may be signed by top management to demonstrate this.

6.4.5 Step 4

Communicating the policy is as important as writing it. The organization should make it available to staff, contractors and the public. In addition, an organization may wish to display its policy at their premises or publicize it on the internet and other media.

The policy should be introduced to new employees, contractors and, where applicable, visitors. It is good practice to display the policy visibly throughout the workplace. Most importantly, top management should emulate the values expressed in the policy commitments through word and deed. Staff should be able to explain to others what the commitments are and how they as individuals play a part in achieving them.

6.5 Setting objectives and targets and establishing programme(s)

6.5.1 General

By setting environmental objectives and targets, and implementing programmes to achieve them, the commitments in the organization's policy are translated into action. Objectives and targets form a central part of the environmental management system and can provide a clear focus for environmental management system activity. By tracking progress against the objectives and targets, management can determine how well the environmental management system is working and whether it is achieving the improvements to which it has committed. The programme is a detailed plan of activities required to support the achievement of the organization's environmental objectives and targets. It provides a clear and defined plan for future proposed activity and responsibilities in both the implementation and the operation of the environmental management system.

Step 1	Step 2	Step 3	Step 4
Recognize the need to establish and implement goals in order to improve performance.	Gather information which will enable objectives, targets and programme(s) to be developed.	Develop and document objectives, targets and programme(s) in order to improve performance.	Work towards achieving objectives and targets through the implementation of the programme(s).

6.5.2 Step 1

The organization should recognize that environmental objectives, targets and programmes to achieve them should be established to improve performance in any element of the organization's environmental management system.

6.5.3 Step 2

6.5.3.1 Programmes are the action plans that the organization puts in place in order to achieve its objectives and targets. A programme defines:

a) how the objectives are to be achieved and the required actions;

b) the timeline for reaching the desired objective;

c) the allocation of resources and assignment of responsibilities for the actions.

6.5.3.2 The following information should be useful in helping the organization to set objectives and targets and to establish an environmental action programme(s):

a) policy commitments;

b) significant environmental aspects;

c) legal and other requirements.

6.5.3.3 Other considerations may include:

a) technological options;

b) operational and business requirements;

c) views of internal and external parties;

d) actions required for achieving objectives and targets;

e) timescales required for achieving objectives and targets;

f) resource requirements for carrying out actions within specified timescales;

g) awareness, skills and knowledge building activities required;

h) roles and responsibilities of individuals or groups for actions towards achieving objectives and targets.

6.5.4 Step 3

Objectives and targets should be measurable and support the commitments made in the environmental policy. The organization should establish performance indicators for each objective and track progress by monitoring them. They should communicate progress to internal and external interested parties. Not all objectives and targets need to be aimed at continual improvement; some may be set to maintain the current level of performance.

More detailed guidance on the setting and use of environmental performance indicators can be found in 6.8.

6.5.5 Step 4

Review existing arrangements against objectives and targets.

Define additional activities and resources needed to achieve objectives and targets.

Objectives, targets and programmes should also be prioritized and tailored to take into account the organization's unique financial position and the costs involved. It should also take into account resources available. Responsibility for working towards objectives and targets should be designated to relevant personnel, functions and levels within the organization. Other considerations should include operational priorities (such as areas for improvements) and business considerations (such as planned expansions or modifications to core business).

6.6 Operational control

6.6.1 General

Operational controls are necessary to ensure that the organization's significant aspects are being managed in a way that minimizes negative impacts and enhances positive impacts on the environment. Control procedures should also support the achievement of objectives and targets, which in turn support the organization's policy commitments to continual improvement and compliance with relevant legal and other requirements.

Step 1	Step 2	Step 3	Step 4
Recognize the need for controlling those operations associated with significant environmental aspects.	Plan the ways in which operations related to the organization's significant aspects are to be controlled.	Develop and implement the controls.	Review the effectiveness of the implemented controls.

6.6.2 Step 1

The organization should recognize that management has a responsibility to control the operations in order to meet its environmental policy commitments, achieve its objectives and targets, comply with environmental legal and other requirements to which the organization subscribes, and to ensure that its significant environmental aspects are minimized.

6.6.3 Step 2

To plan for effective and efficient operational controls, an organization should identify where such controls are needed and what they are intended to achieve.

When determining the controls that it needs, an organization should consider all of its day-to-day activities such as manufacturing, maintenance and product storage as well as those related to management functions, such as purchasing, sales, marketing, research and development, and design and engineering of products. It should also consider how products are transported off-site. In addition, consideration should be given to operations carried out by its contractors or suppliers to the extent that they could affect the management of environmental aspects.

In deciding which controls are appropriate, the organization should initially take a proactive approach and try to eliminate the need for specific controls. If this cannot be achieved, it may be possible to transfer the operational control to another organization (e.g. outsourced waste water treatment facility), but retaining responsibility for the processes related to eventual environmental impacts and to legal requirements. Another option would be to substitute by a lower risk process (use of water-based instead of solvent-based paint). Where a proactive approach cannot be achieved, it may be necessary to respond in a reactive way to minimize the organization's impacts. This may include reduction, reuse and/or recycling, treatment and where all other options are exhausted, disposal.

6.6.4 Step 3

Controls specify the way to carry out an activity or a process and can include engineering controls, such as primary and/or secondary containment, physical barriers and/or administrative controls, such as documented procedures or work instructions, technical specifications in relation to equipment and machinery, and contractual agreements specifying requirements for suppliers/contractors.

Procedures can be very detailed and limited in application (for example a procedure for running a chemical processing operation). They can be complex, for instance a process map, or simple, such as a bullet list of steps, checklist, flowchart or a sequence of pictures, and they should be documented.

In developing the procedures, it is good practice to involve those who actually carry out the operations to ensure that they properly reflect the way that the operations are carried out. Once finalized, the procedure should be communicated to everyone involved in the activity, including contractors and suppliers, if necessary, such that everyone knows what is required.

6.6.5 Step 4

Controls should be reviewed periodically to ensure they are effective (see Figure 2 for an example).

A small company has identified as one of its significant aspects (occurring in abnormal circumstances) that during the filling of the diesel tank used to fuel its boiler, oil could overflow through the tank vent.

The company examined possible controls and decided that the most proactive and effective way to rectify this situation was to use a closed-circuit refuelling system with automatic shut-off valves. However investigation revealed that the fuel supplier had no such equipment and was using a hand-operated open-circuit system to refuel the tank. The introduction of a closed-circuit system would be very expensive.

This left the company to consider a reactive approach to controlling this risk by introducing both engineering and administrative controls as follows.

a) The engineering control they decided to use was to place secondary containment (build a brick wall) around the tank; they considered installing a float-operated shut-off valve, but were concerned about its reliability and elected to use containment instead.

b) They also decided to include a requirement in the fuel supplier's contract that during the filling process the nozzle should not be left unattended and the oil level monitored by the operator at all times.

c) A caution notice was also written and placed adjacent to the fuelling point reminding operators not to leave the filling point while this was in progress and to visually monitor the oil level in the tank.

Figure 2 — Example of operational control

6.7 Planning for and responding to emergencies

6.7.1 General

It is necessary to avoid any environmental impacts that may result from emergency situations. Where such situations occur, controlling and minimizing the impact through effective planning is essential. Being well prepared and ensuring that those working for, or on behalf of, the organization know what to do in such circumstances can reduce the actual impacts to the environment. Emergency plan(s) and associated procedures may be used to define and document effective responses.

Step 1	Step 2	Step 3	Step 4	Step 5
Recognize that emergency situations may occur and need to be managed.	Identify which emergency situations may occur and their potential environmental impacts.	Establish a procedure that responds to the identified potential emergency situation.	Implement and test (where practicable) procedures that responds to the potential emergency situation.	Review responses to emergency situations and revise the procedure, if necessary.

6.7.2 Step 1

An organization should recognize that an accident or emergency can occur.

6.7.3 Step 2

The determination of potential emergency situations such as fire, accidental release, explosions and floods should have been addressed in 6.1 (related to the identification of environmental aspects) and 6.2 (related to their associated impacts and legal requirements). However, circumstances unique to the organization's location or operations may also create emergency situations that need to be addressed, such as sabotage or public disorder.

6.7.4 Step 3

The organization should establish a procedure in order to ensure that identified potential emergency situations are addressed. If an organization already has procedures in place to respond to an emergency, these should be examined to ensure they adequately cover the potential environmental impacts of such emergencies and control mechanisms to minimize them.

6.7.5 Step 4

The organization should implement its emergency procedures and test them in the actual operating environment, where practicable, in order to verify their effectiveness. Practice drills should be seen as an opportunity to learn how to improve emergency preparedness planning.

6.7.6 Step 5

The organization should periodically review and, where necessary, revise its emergency preparedness and response procedures, in particular, as a result of practice drills and the occurrence of emergencies. After the event is over, an evaluation should be conducted to identify the effectiveness of the response. Lessons learned should be captured and corrective and preventive actions developed, with operating procedures being modified accordingly.

6.8 Environmental performance evaluation, including monitoring and measurement

6.8.1 General

In order to monitor, measure and track the organization's environmental performance, it is necessary to set performance indicators. This performance relates to both the management system as well as its outcome. The performance indicators will be used to measure the objectives and targets and to help ensure that the key characteristics are met. The collection (monitoring and measuring progress) and use of environmental performance data can support the continual improvement of environmental performance.

Step 1	Step 2	Step 3	Step 4	Step 5
Recognize the need to evaluate environmental performance and develop indicators for that purpose.	Gather information on the key characteristics and define the performance indicators.	Develop a procedure to monitor and measure in accordance with the environmental performance indicators of the organization.	Collect, measure, analyse and evaluate performance of the organization. Calibrate equipment and retain records.	Evaluate suitability of the indicators.

6.8.2 Step 1

The organization should recognize that improvements are needed in both the performance of the EMS and its outcome. The outcome includes environmental performance related to the activities, products and services of the organization. Performance can be measured by the setting of EPIs.

Performance can be measured using different categories of indicators, including, where appropriate:

— management performance indicators (MPIs) used to track the performance of the organization's EMS, e.g. number of people trained in environmental awareness;

— operational performance indicators (OPIs) providing information relating to the effectiveness of managing environmental aspects, e.g. energy consumption per day;

— environmental condition indicators (ECIs) providing information on the impact that the organization's discharges are having on the environment, e.g. oxygen content in the water downstream of a discharge point.

Monitoring and measuring activities provide key data by which an organization can evaluate its performance against its environmental policy, legal requirements, objectives and targets.

6.8.3 Step 2

6.8.3.1 The organization should gather information on key characteristics in order to develop indicators.

Key characteristics that may require monitoring and measuring include:

— the views of key interested parties;

— objectives and targets established;

— information of significant aspects and impacts;

— monitoring emissions and discharges to meet environmental legal and other requirements to which the organization subscribes;

— monitoring water, energy or raw material consumption to meet objectives and targets;

— progress on policy, objectives and targets, and continual improvement;

— documents (operating instructions, procedures established for the relevant elements of the system, other applicable specifications) containing the key characteristics to be monitored or controlled, including those deriving from legal and other requirements;

— operating instructions for measuring equipment as provided by the supplier (e.g. standard instructions to operate a pH meter).

For each key characteristic (or series of characteristics), define the equipment and method(s) to be applied, either by using recognized test methods [e.g. C.O.D. (chemical oxygen demand) determination] or an analysis of relevant data (e.g. fuel consumption for an evaluation of CO_2 emissions).

When procedures do not refer to standard methods, the method used for monitoring should be documented.

6.8.3.2 Procedures should be developed for monitoring/measuring the key characteristics of the environmental performance.

Monitoring involves collecting information, such as measurements or observations, over time.

Measurements can be either quantitative or qualitative. Monitoring and measurements may serve many purposes in an EMS, such as:

— tracking progress on policy, objectives and targets, and continual improvement;

— developing information to identify significant environmental aspects;

— monitoring emissions and discharges to meet environmental legal and other requirements to which the organization subscribes;

— monitoring water, energy or raw materials consumption to meet objectives and targets;

— providing data to support or evaluate operational controls;

— providing data to evaluate the organization's environmental performance;

— providing data to evaluate the performance of the EMS;

— providing data to initiate corrective and preventive actions.

6.8.4 Step 3

The collected data should be analysed and converted into information describing the organization's environmental performance, expressed as indicators for environmental performance evaluation (EPE). To avoid bias in the results, all relevant and reliable data that have been collected should be considered. Data analysis may include consideration of the data quality, validity, adequacy and completeness necessary to produce reliable information. Information describing the organization's environmental performance can be developed using calculations, best estimates, statistical methods, graphical techniques, or by indexing, aggregating or weighting.

Gather and assess data against the identified key characteristics to determine conformance with environmental objectives, targets and performance indicators. The data provided by this process will be a fundamental input for the management review of the EMS.

An organization should have a systematic approach for measuring and monitoring its environmental performance on a regular basis. To achieve this, an organization should plan what will be measured, where and when it should be measured, and what methods should be used. To focus resources on the most important measurements, the organization should identify the key characteristics of processes and activities that can be measured and that provide the most useful information.

Measurements should be conducted under controlled conditions with appropriate processes for assuring the validity of results, such as adequate calibration of monitoring and measurement equipment, use of qualified personnel and use of suitable quality control methods. Written procedures for conducting measurement and monitoring can help to provide consistency in measurements and enhance the reliability of data produced. Organizations which do not have the internal resources may wish to use external laboratory services.

6.8.5 Step 4

The information derived from analysed data, expressed in terms of EPIs and possibly ECIs, should be evaluated against the organization's environmental performance criteria, including objectives and targets. This evaluation may indicate progress or deficiencies in environmental performance. The information describing the organization's environmental performance and the results of the evaluation should be reported to management, to support appropriate management actions to improve or sustain the level of performance. Ensure that equipment used for monitoring is properly calibrated and the calibration records are retained.

6.8.6 Step 5

The organization should ensure that the indicators selected give a proper representation of environmental performance.

The results of measurement and monitoring should be analysed and used to identify both successes and areas requiring correction or improvement.

6.9 Internal audits

6.9.1 General

It is necessary to conduct internal audits to ensure that the organization's planned arrangements are being met.

An internal audit programme may be carried out as a single activity or divided into smaller parts. It may also be carried out as appropriate for specific, defined objectives. For example, an internal audit may be carried out as a check to ensure that all legal requirements have been identified or that effective communication mechanisms are in place.

In any case, it is important that all units and functions of the organization within the defined scope of its EMS and all elements of its EMS, be completely audited within the auditing period decided upon by the organization.

Step 1	Step 2	Step 3	Step 4	Step 5
Recognize the need to ensure that the system is properly implemented and meets planned arrangements.	Gather information in order to develop the audit programme.	Plan and implement an audit programme.	Report audit findings to management and act upon them.	Identify improvements to internal auditing.

6.9.2 Step 1

The organization should recognize that performing internal audits will give it an indication as to whether procedures and practices have actually been implemented and are functioning as planned.

6.9.3 Step 2

It is necessary to determine what should be audited, when and to what depth, so as to identify which areas are working well and which are not.

Auditors should be competent and should be familiar with the proposed EMS and, where appropriate, details of the appropriate standard.

A variety of information sources can be used to guide the development of a focused audit plan. Such information might include:

— information related to the system elements and operational controls within the units or functions;

— information regarding the extent to which objectives and targets have been met, and records regarding environmental performance and the effectiveness of operational controls;

— local environmental issues surrounding the organization's site;

— information from on-site observations;

— interviews with personnel.

6.9.4 Step 3

The responsibility for managing an audit programme should be assigned to an individual with knowledge and understanding of audit principles, the expected competence of auditors and the application of audit techniques. An audit programme to direct the planning and carrying out of audits should include consideration of the information gathered in step 2.

The individual should decide how the area will be audited, for example by procedure or by department, and when they are to be audited.

The frequency of audits should be based on environmental importance and the findings of previous audits.

During the planning process an audit procedure should be established which reflects how the organization has planned its audit programme, including audit criteria, scope, frequency and the methods used.

6.9.5 Step 4

When a full programme of internal audits has been carried out, audit findings on nonconformities or any necessary improvements identified should be reported to management so that they can be corrected or carried out.

The result of audits should be recorded and maintained.

6.9.6 Step 5

The organization should review the audit programme and procedure(s) to ensure that it continues to be effective. For example the organization should check whether to adjust audit frequency based upon previous audit findings and whether conditions have changed for different aspects. In addition, the auditor's competence should be assessed periodically and maintained appropriately.

6.10 Managing when things do not go as planned

6.10.1 General

Where it is identified that the organization's stated policies and planned actions (and resulting procedures, where applicable) are not being conformed with, it will be necessary to develop and take corrective or preventive actions. This is a fundamental element of any successful system and is at the heart of continual improvement. Such nonconformities can be identified in a number of ways and reporting these should not be restricted to the audit process.

Step 1	Step 2	Step 3	Step 4	Step 5
Recognize that things can go wrong (nonconformity) and that action should be taken to correct and/or avoid their occurrence.	Identify what went wrong and correct it.	Analyse why it went wrong and identify actions to avoid reoccurrence.	Identify what could go wrong and take actions to prevent occurrence.	Review the effectiveness of corrective action(s) and take preventive action(s).

6.10.2 Step 1

The organization should become aware that:

— things do not always happen as planned and that action should be taken when they go wrong to correct or mitigate the environmental impact caused;

— action should be taken to avoid the reoccurrence of what went wrong;

— action should be taken to avoid the occurrence of what could go wrong.

6.10.3 Step 2

The organization should establish and implement a procedure to:

— identify the things that have gone wrong (nonconformities). This could be carried out using observation, analysis of measurement results or audits;

— initiate and implement corrections of actual nonconformities (e.g. remediate a spillage, collect waste located in the wrong place, calibrate non-calibrated measuring equipment).

Actions taken should be appropriate to the nature and the magnitude of the environmental impacts caused by the nonconformity.

6.10.4 Step 3

The organization should establish and implement a procedure to:

— analyse the cause of the actual nonconformities;

— take action to eliminate that cause.

Corrective actions taken should be appropriate to the nature and the magnitude of the environmental impact caused by the nonconformity.

6.10.5 Step 4

The organization should establish and implement a procedure to:

— identify potential nonconformities;

— analyse the cause of those potential nonconformities;

— take action to eliminate that cause.

Preventive actions taken should be appropriate to the nature and the magnitude of the environmental impact that the potential nonconformity might cause.

6.10.6 Step 5

The organization should establish a procedure that also describes how the organization:

— follows up corrective and preventive actions to ensure their timely implementation;

— verifies their effectiveness.

6.11 Management review of progress and performance

6.11.1 General

Management review of the implementation and direction of the EMS should occur as a periodic activity throughout the implementation process. Moreover, the management review process provides an opportunity to evaluate progress on improvement of environmental performance. In addition, however, formal management review activities provide top management with a structured opportunity for reviewing the performance of the EMS and its continuing suitability, adequacy and effectiveness. Furthermore, management representatives can contribute directly to the strategy and decision-making processes relating to the operation and continual development of the EMS. It allows for management to address the need for changes to central elements of the EMS, such as policy, objectives and targets, and the programme in the light of experience and changing circumstances.

The management review may be carried out in any form, but should include information regarding the environmental performance of the organization and performance of the EMS. Records of the review should be retained.

Where appropriate, persons who are responsible for implementing the EMS and for providing resources should be involved in this review. The management review should be held as often as appropriate.

Step 1	Step 2	Step 3
Recognize the need to review the performance of an EMS.	Identify inputs to the review process.	Review the suitability, adequacy and effectiveness of the EMS. Identify improvement opportunities. Secure improvements to the system and/or actual performance.

6.11.2 Step 1

The organization's top management should realize the need to periodically evaluate the performance of its EMS and look for areas of improvement.

6.11.3 Step 2

Management review should use as inputs:

— results of internal audits and corrective actions addressing audit findings;

— communication from external interested parties, including complaint records;

— results of evaluations of compliance with legal and other requirements to which the organization subscribes;

— the environmental performance of the organization (results of monitoring and measurement of environmental performance indicators on the key characteristics of its significant environmental aspects);

— review progress of objectives, targets and programmes;

— status of corrective and preventive actions;

— follow-up actions from previous management reviews;

— information on changing circumstances, including developments in legal and other requirements related to the organization's environmental aspects;

— changes and anticipated changes to the organization's activities, products or services;

— assessment of environmental aspects which are likely to result from planned or new developments;

— scientific and technological progress related to the organization's environmental aspects;

— lessons learned from emergencies and near misses;

— trends in stakeholder views;

— recommendations for improvements and planning of necessary resources.

6.11.4 Step 3

Specific actions should be decided for enhancing the environmental management system in order to achieve improvements in overall environmental performance.

To meet the purpose of an EMS and in the interest of continual improvement, decisions and actions for improvement should arise as outputs of each management review.

Top management should confirm the results of actions taken after the management review.

The results of the management reviews should be recorded.

Annex A
(informative)

Overview of activities

A.1 Implementing an EMAS-conformant environmental management system

A.1.1 General

This annex[1)] is intended to give advice on the enhancements required when aiming at Eco-management and Audit Scheme (EMAS) conformity of the EMS, based on the stages already achieved in accordance with this International Standard. It also provides an overview with regard to the steps and phases leading from the initial stages of an EMS over ISO 14001 conformity to covering all requirements of EMAS. This International Standard was developed to assist organizations, in particular SMEs, with a specific way of implementing an EMS: i.e. phased implementation. This approach is based on the fact that any organization has some kind of management system in place, however, it may not be well documented and may not cover all elements of good practice to the degree laid down in the respective EMS standard.

Using the information in Table A.1, an organization can assess the coverage of requirements of its system compared to ISO 14001 or EMAS, and then gradually enhance those areas that are not (fully) conformant with the standard requirements. Organizations, in particular SMEs, can, instead of strictly following the EMS standards' structure, choose to start enhancing an existing system first in those areas where this provides the biggest benefit or can be accomplished most easily. In addition, this International Standard took up the important issue that instead of only focusing on improvement of the system, performance improvement should be the goal. EMAS takes this even further by requiring public performance reports and prescribing specific performance indicators to be covered.

EMAS is based on European Regulation (EC) No. 1221/2009. The scheme is entirely voluntary and participation is open to any organization, including organizations in non-European countries, although EMAS registration is restricted to organizations operating in European Community Member States and Iceland, Norway and Liechtenstein.

EMAS incorporates an environmental management system in line with ISO 14001 and those organizations with an ISO 14001-certified EMS can progress towards EMAS registration by incorporating a number of additional elements. Some of these elements are already incorporated in this International Standard.

A.1.2 Elements that support the implementation and maintenance of an EMS (Clause 5)

A.1.2.1 Putting provisions for employee involvement in place with regard to EMAS

A.1.2.1.1 The organization should acknowledge that active employee involvement is a driving force and a prerequisite for continuous and successful environmental improvements, as well as being a key resource in the improvement of environmental performance; it is also the right method to anchor the environmental management and audit system in the organization in a successful way.

A.1.2.1.2 The term “employee participation” includes both participation of, and information to the individual employee and his representatives. Therefore, there should be an employee participation scheme at all levels. The organization should acknowledge that commitment, responsiveness and active support from the management is a prerequisite for the success of those processes. In this context, the necessity of feedback from the management to the employees should be stressed.

1) Prepared for BS EN ISO 14005 (under preparation).

A.1.2.1.3 In addition to these requirements, employees should be involved in the process aimed at continually improving the organization's environmental performance through:

a) the initial environmental review, the analysis of the status quo and in collecting and verifying information;

b) the establishment and implementation of an environmental management and audit system improving environmental performance;

c) environmental committees to gather information and ensure the participation of environmental officer/management representatives, and employees and their representatives;

d) joint working groups for the environmental action programme and environmental auditing;

e) the elaboration of the environmental statements.

A.1.2.1.4 Appropriate forms of participation, such as the suggestion-book system, project-based group work or environmental committees should be used for this purpose. Organizations should take note of Commission guidance on best practice in this field. Where they so request, any employee representatives should also be involved.

The following implementation steps are distinguished:

Step 1	***Step 2***	***Step 3***	***Step 4***
Acknowledge that active employee involvement is a driving force and a prerequisite for continuous environmental improvement	*Acknowledge that employee involvement is the correct method to anchor the environmental management and audit system in the organization in a successful way*	*Implement an employee participation scheme at all levels. There is commitment, responsiveness and active support from management, including feedback to employees*	*Employees are involved in* *a) the initial environmental review,* *b) the establishment and implementation of an environmental management and audit system,* *c) environmental committees,* *d) joint working groups for the environmental action programme and environmental auditing, and* *e) the elaboration of the environmental statement*

A.1.2.2 Communication

Relevance: communication can be to both internal and external stakeholders. The main driver for internal communications is to get buy-in and continuous support from management and employees, whereas external communication aims at involving external parties with respect to consideration of their expectations as well as making the achievements of the organization known to the outside world.

Whereas in the context of ISO 14001, the organization is free to decide whether to communicate at all and if so, in which format, the Environmental Statement in EMAS is mandatory and specific with respect to content and frequency of communication.

The following implementation steps are distinguished:

Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
Recognize the need and value of communicating on environmental issues.	Identify what will be communicated and to whom ***For EMAS: Take into account mandatory public availability of the Environmental Statement [see requirements in Regulation (EC) No. 1221/2009, Part B.3]***	Plan how information will be communicated with interested parties ***For EMAS: When developing key performance indicators, the EMAS requirements, as set out in Regulation (EC) No. 1221/2009, Part B.3, should be considered***	Implement the communication process ***For EMAS: The organization should be able to demonstrate to the environmental verifier that information on environmental performance is easily and freely available, at least in (one of) the official language(s) of the Member State in which it is registered. See further details on the EMAS requirements in Regulation (EC) No. 1221/2009, Part B.3***	Monitor the results of communications to determine if they have been effective.	***Issue an environmental statement, meeting the minimum requirements as set out in Regulation (EC) No. 1221/2009, Part B.3***

Additional requirements for EMAS in step 2

For EMAS: Take into account mandatory public availability of the Environmental Statement [see details in A.2.2.3].

Additional requirements for EMAS in step 3

For EMAS: When developing key performance indicators, the EMAS requirements, as set out in A.2.2.3, should be considered.

Additional requirements for EMAS in step 4

For EMAS: The organization should be able to demonstrate to the environmental verifier that information on the organization's environmental performance is easily and freely available.

The organization should ensure that this information is available in (one of) the official language(s) of the Member State in which it is registered and, if applicable, in (one of) the official language(s) of those Member States in which sites covered by the corporate registration are located [see details in A.2.2.3].

Additional requirements for EMAS (new step 6)

Issue an environmental statement, meeting the minimum requirements as set out in Regulation (EC) No. 1221/2009, Part B.3.

A.1.2.3 Competence, training and awareness

Relevance: environmental awareness among employees and contractors of the organization is crucial for implementing an effective EMS. It is necessary for the organization to ensure that employees and contractors who carry out activities which can impact upon the environment are competent to do so. This may require additional training.

Additional requirements for EMAS (new step 6)

For EMAS, there is an employee participation scheme required at all levels.

In particular, employees should be involved in the initial environmental review, the establishment and implementation of the environmental management and audit system, environmental committees, joint working groups and elaboration of the environmental statement.

A.1.3 Development and implementation of an EMS (Clause 6) — Additional elements with regard to EMAS

A.1.3.1 Important for EMAS — Scope of the EMS

a) Be aware that for EMAS registration the scope of the EMS is related to a site except in certain circumstances.

b) Remark: EMAS provides requirements related to the understanding of the concept of site, including allowing registration of:

   — "cluster" organizations (i.e. a number of SMEs with similar environmental aspects), and

   — virtual organizations (those without a physical site, e.g. consultants, logistics and transportation).

A.1.3.2 Environmental review — EMAS-specific

A.1.3.2.1 Relevance

The environmental review means an initial comprehensive analysis of environmental aspects, environmental impacts and environmental performance related to an organization's activities, products and services. It is used to design the EMS.

The following implementation steps are distinguished:

Step 1	Step 2	Step 3	Step 4	Step 5
Review of legislative, regulatory and other requirements ***Outside the European Community, reference should be made to the legal requirements in the Member State where registration is intended***	***Identification of all environmental aspects with a significant environmental impact in accordance with Annex I of Regulation (EC) No. 1221/2009***	***Criteria for assessing the significance of the environmental impact should be in accordance with Annex I, point 3 of Regulation (EC) No. 1221/2009***	***Examination of all existing environmental management practices and procedures***	***Evaluation of feedback from the investigation of previous incidents***

A.1.3.2.2 Additional requirements

Additional requirements for EMAS (all steps are additional, as the initial review is a special topic in EMAS)

Step 1:

Review of legislative, regulatory and other requirements to which the organization subscribes.

Organizations outside the European Community should also make reference to the legal requirements relating to the environment applicable to similar organizations in the Member States where they intend to submit an application. Identification of all environmental aspects with a significant environmental impact in accordance with Annex I of Regulation (EC) No. 1221/2009, qualified and quantified as appropriate, and comprising a register of those identified as significant.

Step 2:

Description of the criteria for assessing the significance of the environmental impact in accordance with Annex I, point 3 of Regulation (EC) No. 1221/2009.

Step 3:

Examination of all existing environmental management practices and procedures.

Step 4:

Evaluation of feedback from the investigation of previous incidents.

Step 5:

Details on EMAS requirements in Regulation (EC) No. 1221/2009, Annex I.

A.1.3.3 Identifying the organization's significant environmental aspects

A.1.3.3.1 Relevance

All organizations have a management system through which they perform their activities. It can be divided into a number of parts or subsystems that may be managed separately. Such subsystems reflect the different needs and expectations of stakeholders (see Reference [21]). Considering the subsystem which deals with managing aspects of the performance related to the environment (Environmental Management System – EMS), identifying the ways in which its activities, products and services can impact the environment (these are known as the organization's "environmental aspects") and determining which of these are the most important (significant) are essential steps in establishing such EMS. They help the organization to focus its resources and efforts on actions that minimize, eliminate or at least control any negative impacts and accentuate positive impacts. Managing environmental aspects not only provides significant environmental improvement, but can also generate financial benefit and other commercial benefits.

The following implementation steps are distinguished:

Step 1	Step 2	Step 3	Step 4
Recognize that the organization's activities, products and services interact with the environment.	Develop and implement a procedure to identify the organization's environmental aspects. See 3.4 for scope of the EMS. ***For EMAS: Differentiate between direct and indirect aspects***	Develop and implement a procedure to determine those aspects that have, or can have, significant impact(s) on the environment. ***For EMAS: Use significance criteria that is capable of independent checking, reproducible and made publicly available***	Compile and keep an up-to-date list of significant aspects.

A.1.3.3.2 Additional requirements

Additional requirements for EMAS in step 2

An organization intending to implement EMAS should consider:

— *that while ISO 14001 distinguishes environmental aspects the organization can control versus those it can influence, EMAS is more precise in using the terms direct and indirect aspects;*

— *Regulation (EC) No. 1221/2009, Annex I, provides examples for the two groups of environmental aspects, whereas a specific guidance document is available related to the choice of criteria to use to assess significance [Regulation (EC) No. 1221/2009, Annex I].*

Details on EMAS requirements can be found in Regulation (EC) No. 1221/2009, Annex I.

Additional requirements for EMAS in step 3

An organization intending to implement EMAS should consider:

— *that its significance criteria should be comprehensive, capable of independent checking, reproducible and made publicly available.*

Details on EMAS requirements can be found in Regulation (EC) No. 1221/2009, Annex I.

A.1.3.4 Identifying the organization's legal and other requirements

A.1.3.4.1 Relevance

Identifying all relevant legal obligations and other requirements is essential for any environmental management system. It is important that the organization understand those legal obligations which are related to its environmental aspects in order to meet its obligation to society, ensure legal compliance, prevent prosecution, avoid fines and to maintain or improve its image. Because legal obligations vary from country to country, they are unique to each organization and site. Other requirements to which the organization may subscribe can include non-binding protocols, voluntary agreements and/or codes of practice.

The following implementation steps are distinguished:

Step 1	Step 2	Step 3	Step 4
Recognize that the organization may need to comply with legal and other requirements that relate to its environmental aspects.	Identify relevant legal and other requirements. ***For EMAS: Legal compliance includes permits and permit limits***	Determine how the legal and other requirements apply to the organization's environmental aspects.	Keep an up-to-date understanding of the legal and other requirements which are applicable to the organization.

A.1.3.4.2 Additional requirements

Additional requirements for EMAS in Step 2

For EMAS, legal compliance includes permits and permit limits; details on EMAS requirements can be found in Regulation (EC) No. 1221/2009, Part B.4.

A.1.3.5 Evaluating compliance with the organization's legal and other requirements

A.1.3.5.1 Relevance

Having identified legal obligations and other requirements, it is essential to verify how well the organization is complying with them. In order to demonstrate compliance on a continual basis, methods and indicators should be established to measure compliance. Evaluation of compliance is also necessary to demonstrate improvements in performance.

The following implementation steps are distinguished:

Step 1	Step 2	Step 3	Step 4	Step 5
Recognize that the organization is subject to legal and other requirements and that it needs to comply with them.	Identify and plan the methods used to monitor and measure compliance.	Periodically evaluate compliance with all legal and other requirements.	Record and report the results of the evaluation including compliance and/or non-compliance with all legal and other requirements.	***Demonstrate legal compliance, including permits and permit limits, and have procedures in place to meet these requirements on an ongoing basis***

A.1.3.5.2 Additional requirements

Additional requirements for EMAS in step 5

Demonstrate legal compliance, including permits and permit limits, and have procedures in place to meet these requirements on an ongoing basis [see details on the EMAS requirements in Regulation (EC) No. 1221/2009, Part B.2].

A.1.3.6 Preparing and implementing an environmental policy

A.1.3.6.1 Relevance

The environmental policy is a short public declaration that outlines the intentions and commitments of the organization with respect to improving its environmental performance.

The following implementation steps are distinguished:

Step 1	Step 2	Step 3	Step 4
Recognize the need to have an environmental policy for the organization.	Prepare a preliminary environmental policy suitable for the organization. ***For EMAS: The environmental policy should include a commitment for continual improvement of environmental performance***	Finalize the environmental policy document.	Make environmental policy available to the public. Make all those working for and on behalf of the organization aware of its content and meaning.

A.1.3.6.2 Additional requirements

Additional requirements for EMAS in step 2

For EMAS, the environmental policy should include a commitment to continual improvement of environmental performance [see details on the EMAS requirements in Regulation (EC) No. 1221/2009, Part B.6].

A.1.3.7 Planning/setting objectives and targets, and establishing programme(s)

A.1.3.7.1 Relevance

By setting environmental objectives and targets and implementing action plans to achieve them, the commitments in the organization's policy are translated into action. Objectives and targets form a central part of the environmental management system and can provide a clear focus for environmental management system activity. By tracking progress against the objectives and targets, management can determine how well the environmental management system is working and whether it is achieving the improvements to which it has committed. The programme is a detailed plan of activities required to support the achievement of the organization's environmental objectives and targets. It provides a clear and defined plan for future proposed activity and responsibilities in both the implementation and the operation of the environmental management system.

The following implementation steps are distinguished:

Step 1	Step 2	Step 3	Step 4
Recognize the need to establish and implement goals in order to improve performance.	Gather information which will enable objectives, targets and programme(s) to be developed.	Develop and document objectives, targets and programme(s) in order to improve performance.	Work towards achieving objectives and targets through the implementation of the programme(s). ***For EMAS: The means to achieve the objectives and targets cannot be environmental objectives***

A.1.3.7.2 Additional requirements

Additional requirements for EMAS in step 4

For EMAS, the means to achieve the objectives and targets cannot be environmental objectives [see details on the EMAS requirements in Regulation (EC) No. 1221/2009, Annex II, B.3, 3)].

A.1.3.8 Environmental performance evaluation, including monitoring and measurement

A.1.3.8.1 Relevance

In order to monitor, measure and track the organization's environmental performance it is necessary to set performance indicators. This performance relates to both the management system as well as its outcome. The performance indicators will be used to measure the objectives and targets and to help ensure that the key characteristics are met. The collection (monitoring and measuring progress) and use of environmental performance data can support the continual improvement of environmental performance.

The following implementation steps are distinguished:

Step 1	Step 2	Step 3	Step 4	Step 5
Recognize the need to evaluate environmental performance and develop indicators for that purpose. ***For EMAS: When developing key performance indicators, the EMAS requirements as set out in Regulation (EC) No. 1221/2009, Annex II, Part B should be considered*** ***Organizations should be able to demonstrate that the management system and audit procedures address the actual environmental performance*** ***If the organization comprises more than one site, each of the sites should comply with the requirements of EMAS, including continual improvement of environmental performance.*** ***Details on the EMAS requirements in Regulation (EC) No. 1221/2009, Annex II, Parts B.1 and B.3***	Gather information on the key characteristics and define the performance indicators. ***For EMAS: When developing key performance indicators, the EMAS requirements as set out in Regulation (EC) No. 1221/2009, Annex II, Part B should be considered*** ***Details on the EMAS requirements in Regulation (EC) No. 1221/2009, Part B.1***	Develop a procedure to monitor and measure in accordance with the environmental performance indicators of the organization. ***For EMAS: When developing key performance indicators, the EMAS requirements as set out in Regulation (EC) No. 1221/2009, Annex II, Part B should be considered*** ***Details on the EMAS requirements in Regulation (EC) No. 1221/2009, Part B.1***	Collect, measure, analyse and evaluate performance of the organization Calibrate equipment and retain records. ***For EMAS: When developing key performance indicators, the EMAS requirements as set out in Regulation (EC) No. 1221/2009, Annex II, Part B should be considered*** ***Details on the EMAS requirements in Regulation (EC) No. 1221/2009, Part B.1***	Evaluate suitability of the indicators. ***For EMAS: Any change of key performance indicators should be in line with EMAS requirements as set out in Regulation (EC) No. 1221/2009, Annex II, Part B*** ***Details on the EMAS requirements in Regulation (EC) No. 1221/2009, Part B.1***

A.1.3.8.2 Additional requirements

Additional requirements for EMAS in step 1

When developing key performance indicators, the EMAS requirements as set out in Regulation (EC) No. 1221/2009, Annex II, Part B should be considered.

Organizations should be able to demonstrate that the management system and audit procedures address the actual environmental performance.

If the organization comprises more than one site, each of the sites should comply with the requirements of EMAS, including continual improvement of environmental performance [see details on EMAS requirements in Regulation (EC) No. 1221/2009, Annex II, Parts B.1 and B.3].

Additional requirements for EMAS in step 2

For EMAS, the means to achieve the objectives and targets cannot be environmental objectives [see details on the EMAS requirements in Regulation (EC) No. 1221/2009, Annex II, B.3, 3)].

Additional requirements for EMAS in step 3

For EMAS, the means to achieve the objectives and targets cannot be environmental objectives [see details on the EMAS requirements in Regulation (EC) No. 1221/2009, Annex II, B.3, 3)].

Additional requirements for EMAS in step 4

Note that for EMAS, the means to achieve the objectives and targets cannot be environmental objectives [see details on EMAS requirements in Regulation (EC) No. 1221/2009, Annex II, B.3, 3)].

Additional requirements for EMAS in step 5

For EMAS, the means to achieve the objectives and targets cannot be environmental objectives [see details on the EMAS requirements in Regulation (EC) No. 1221/2009, Annex II, B.3, 3)].

A.1.3.9 Internal audits

A.1.3.9.1 Relevance

It necessary to conduct internal audits to ensure that the organization's planned arrangements are being met and that the EMS conforms to the pre-selected standard(s).

An internal audit may be carried out as a single activity or divided into smaller parts which together make up a complete audit programme.

It may also be carried out as appropriate for specific, defined objectives.

For example, an internal audit may be carried out as a check to ensure that all legal requirements have been identified or that effective communication mechanisms are in place.

In any case, it is important that all units and functions of the organization within the defined scope of its EMS, and all elements of its EMS, have been completely audited within the auditing period decided upon by the organization.

A.1.3.9.2 Additional requirements

There are no additional requirements resulting from EMAS.

A.1.3.10 Nonconformity handling — Managing when things do not go as planned

A.1.3.10.1 Relevance

Where it is identified that the organization's stated policies and planned actions (and resulting procedures, if applicable) are not being conformed with, it will be necessary to develop and take corrective or preventive actions. This is a fundamental element of any successful system and is at the heart of continual improvement. Such nonconformities can be identified in a number of ways and reporting these should not be restricted to the audit process.

A.1.3.10.2 Additional requirements

There are no additional requirements resulting from EMAS.

A.1.3.11 Management review of progress and performance

A.1.3.11.1 Relevance

Management review of the implementation and direction of the EMS should occur as an ongoing activity throughout the implementation process. Moreover, the management review process provides an opportunity to evaluate progress on improvement of environmental performance. In addition, however, formal management review activities provide top management with a structured opportunity for reviewing the performance of the EMS and its continuing suitability, adequacy and effectiveness. Furthermore, management representatives can contribute directly to the strategy and decision-making processes relating to the operation and continual development of the EMS. It allows management to address the need for change to central elements of the EMS, such as policy, objectives and targets, and the programme in the light of experience and changing circumstances.

The management review may be carried out in any form, but should include information regarding the environmental performance of the organization and performance of the EMS. Records of the review should be retained.

Where appropriate, persons who are responsible for implementing the EMS and for providing resources should be involved in this review. The management review should be held as often as appropriate.

The following implementation steps are distinguished:

Step 1	Step 2	Step 3	Step 4
Recognize the need to review the performance of an EMS.	Identify inputs to the review process.	Review the suitability, adequacy and effectiveness of the EMS. Identify improvement opportunities. Secure improvements of the system and/or actual performance.	***Performance of the organization against its objectives and targets should be evaluated as part of the management review process.*** ***Details on the EMAS requirements in Regulation (EC) No. 1221/2009, Annex II, B.3, 2) and B.6***

A.1.3.11.2 Additional requirements

Additional requirements for EMAS (new step 4)

When developing key performance indicators, the EMAS requirements set out in Regulation (EC) No. 1221/2009, Annex B should be considered.

A.2 Details on additional requirements from Regulation (EC) No. 1221/2009

A.2.1 EMAS core indicators and other performance indicators [new under Regulation (EC) No. 1221/2009, adds to step 3 in 5.1 and 6.8]

A.2.1.1 General

Organizations should report, both in the environmental statement and the updated environmental statement, on the core indicators insofar as these relate to the direct environmental aspects of the organization and other relevant existing environmental performance indicators as set out below.

The reporting should provide data on actual input/impact. If disclosure would adversely affect the confidentiality of commercial or industrial information of the organization where such confidentiality is provided for by national or European Community law to protect a legitimate economic interest, the organization may be permitted to index this information in its reporting, e.g. by establishing a base line year (with the index number 100) from which the development of the actual input/impact would appear.

The indicators should:

a) give an accurate appraisal of the organization's performance;

b) be understandable and unambiguous;

c) allow for a year-on-year comparison to assess the development of the environmental performance of the organization;

d) allow for comparison with sector, national or regional benchmarks, as appropriate;

e) allow for comparison with regulatory requirements, as appropriate.

A.2.1.2 Core indicators

A.2.1.2.1 Core indicators should apply to all types of organizations. They focus on performance in the following key environmental areas:

a) energy efficiency;

b) material efficiency;

c) water;

d) waste;

e) biodiversity;

f) emissions.

Where an organization concludes that one or more core indicators are not relevant to its significant direct environmental aspects, that organization may not report on those core indicators. The organization should provide justification to that effect with reference to its environmental review.

A.2.1.2.2 Each core indicator is composed of:

a) a Figure A indicating the total annual input/impact in the given field;

b) a Figure B indicating the overall annual output of the organization;

c) a Figure R indicating the ratio A/B.

A.2.1.2.3 Each organization should report on all three elements for each indicator.

The indication of the total annual input/impact in the given field, Figure A, should be reported as follows:

a) on energy efficiency:

   1) concerning the “total direct energy use”, should indicate the total annual energy consumption, expressed in MWh or GJ;

   2) concerning the “total renewable energy use”, should indicate the percentage of total annual energy (electricity and heat) consumption produced by the organization from renewable energy sources;

b) on material efficiency: concerning the “annual mass-flow of different materials used” (excluding energy carriers and water), expressed in tons;

c) on water: concerning the “total annual water consumption”, expressed in cubic metres;

d) on waste:

   1) concerning the “total annual generation of waste”, broken down by type, expressed in tons;

   2) concerning the “total annual generation of hazardous waste”, expressed in kilograms or tons;

e) on biodiversity: concerning the “use of land”, expressed in square metres of built-up area;

f) on emissions:

   1) concerning the “total annual emission of greenhouse gases”, including at least emissions of CO_2, CH_4, N_2O, HFCs, PFCs and SF_6, expressed in tons of CO_2 equivalent;

   2) concerning the “total annual air emission”, including at least emissions of SO_2, NO_X and PM, expressed in kilograms or tons.

In addition to the indicators defined in this subclause, an organization may also use other indicators to express the total annual input/impact in the given field.

A.2.1.2.4 The indication of the overall annual output of the organization (Figure B mentioned in A.2.1.2.2) is the same for all fields, but is adapted to the different types of organizations, depending on their type of activity, and should be reported as follows.

a) For organizations working in the manufacturing sector (industry), it should indicate the total annual gross value-added output, expressed in millions of Euro or total annual physical output expressed in tons or, in the case of small organizations, the total annual turnover or number of employees.

b) For organizations in the non-manufacturing sectors (administration/services), it should relate to the size of the organization, expressed in number of employees.

In addition to the indicators defined above, an organization may use also other indicators to express its overall annual output.

A.2.1.3 Other relevant environmental performance indicators

Each organization should also report annually on its performance relating to the more specific environmental aspects as identified in its environmental statement and, where available, take account of sectoral reference documents as referred to in Regulation (EC) No. 1221/2009, Article 46.

A.2.2 EMAS environmental statement and updated environmental statement (step 6 in 5.1)

A.2.2.1 Intention

The intention of this step is to assist an organization to prepare its environmental statement.

In particular, this module

— describes how to develop and manage the collection of data and information;

— explains how to communicate policies and statements with the public and other interested parties, including employees;

— explains how to compile the environmental statement and ensure it is written in non-technical language and is publicly available and verifiable.

A.2.2.2 Composition of required contents

The environmental statement should contain at least the three elements and should meet the following minimum requirements:

a) a clear and unambiguous description of the organization registering under EMAS and a summary of its activities, products and services and its relationship to any parent organizations, as appropriate;

b) the environmental policy and a brief description of the environmental management system of the organization;

c) a description of all the significant direct and indirect environmental aspects, which result in significant environmental impacts of the organization and an explanation of the nature of the impacts as related to these aspects [see Regulation (EC) No. 1221/2009, Annex I.2];

d) a description of the environmental objectives and targets in relation to the significant environmental aspects and impacts;

e) a summary of the data available on the performance of the organization against its environmental objectives and targets with respect to its significant environmental impacts. Reporting should be on the core indicators and other relevant existing environmental performance indicators as set out in Annex IV of Regulation (EC) No. 1221/2009;

f) other factors regarding environmental performance, including performance against legal provisions with respect to their significant environmental impacts;

g) a reference to the applicable legal requirements relating to the environment;

h) the name and accreditation or licence number of the environmental verifier and the date of validation.

The updated environmental statement should contain at least the three elements and should meet the minimum requirements listed in e) to h).

The organization will develop a statement that meets the above-mentioned EMAS requirements, aiming to use simple language and illustrations to facilitate the understanding of the information and data. Through internal consultation with relevant individuals, it should ensure information and data in the statement are a fair reflection of the situation and cannot be deemed as misleading.

A.2.2.3 Public availability of environmental performance information [new under Regulation (EC) No. 1221/2009, adds to step 4 in 5.1]

The organization should be able to demonstrate to the environmental verifier that anybody interested in the organization's environmental performance can easily and freely be given access to the information required above under points B and C of Regulation (EC) No. 1221/2009, Annex IV.

The organization should ensure that this information is available in (one of) the official language(s) of the Member State in which the organization is registered and, if applicable, in (one of) the official language(s) of those Member States in which sites covered by the corporate registration are located.

A.2.2.4 Legal compliance (proposed addition as step 5 in 6.2)

Organizations wishing to register with EMAS should be able to demonstrate that they:

a) have identified and know the implications to the organization of all applicable legal requirements relating to the environment, identified during the environmental review according to Regulation (EC) No. 1221/2009, Annex I;

b) provide for legal compliance with environmental legislation, including permits and permit limits;

c) have procedures in place that enable the organization to meet these requirements on an ongoing basis.

A.2.2.5 Environmental review [Chapter 3.3, Section A of Regulation (EC) No. 1221/2009]

The review should cover five key areas:

a) legislative, regulatory and other requirements to which the organization subscribes;

b) an identification of all environmental aspects with a significant environmental impact in accordance with Annex I of Regulation (EC) No. 1221/2009, qualified and quantified as appropriate, and comprising a register of those identified as significant;

c) a description of the criteria for assessing the significance of the environmental impact in accordance with Annex I, point 3 of Regulation (EC) No. 1221/2009;

d) an examination of all existing environmental management practices and procedures;

e) an evaluation of feedback from the investigation of previous incidents.

Organizations outside the European Community should also make reference to the legal requirements relating to the environment applicable to similar organizations in the Member States where they intend to submit an application.

A.2.2.6 Performance/continual improvement (proposed addition to step 1 in 6.8)

a) Organizations should be able to demonstrate that the management system and the audit procedures address the actual environmental performance of the organization with respect to the direct and indirect aspects identified in the environmental review under Annex I of Regulation (EC) No. 1221/2009.

b) The performance of the organization against its objectives and targets should be evaluated as part of the management review process. The organization should also commit itself to the continual improvement of its environmental performance. In doing so, the organization may base its action on local, regional and national environmental programmes.

c) The means to achieve the objectives and targets cannot be environmental objectives. If the organization comprises one or more sites, each of the sites to which EMAS applies should comply with all the requirements of EMAS, including the continual improvement of environmental performance as defined in Article 2(2) of Regulation (EC) No. 1221/2009.

Table A.1 — Overview of the elements to implement an EMS

Row	Subclause of this International Standard	Subclause of ISO 14001:2004	Element	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
1	3.2	—	*Environmental review*	*Review of legislative, regulatory and other requirements* *Outside the European Community, reference to be made to the legal requirements in the Member State where registration is intended*	*Identification of all environmental aspects with a significant environmental impact in accordance with Annex I of Regulation (EC) No. 1221/2009*	*Criteria for assessing the significance of the environmental impact should be in accordance with Annex I, point 3 of Regulation (EC) No. 1221/2009*	*Examination of all existing environmental management practices and procedures*	*Evaluation of feedback from the investigation of previous incidents*	
2	6.1	4.1, 4.3.1	Identification of the organization's significant environmental aspects	Recognize that the organization's activities, products and services interact with the environment.	Develop and implement a procedure to identify the organization's environmental aspects. See 3.4 for scope of the EMS.	Develop and implement a procedure to determine those aspects that have, or can have significant impact(s) on the environment. *For EMAS: Need to consider that significance criteria should be comprehensive, capable of independent checking, reproducible and made publicly available*	Compile and keep up-to-date a list of significant aspects.		
3	6.2	4.3.2	Identification of the organization's legal and other requirements	Recognize that the organization may need to comply with legal and other requirements that relate to its environmental aspects.	Identify relevant legal and other requirements. *For EMAS: Legal compliance includes permits and permit limits*	Determine how the legal and other requirements apply to the organization's environmental aspects.	Keep an up-to-date understanding of the legal and other requirements which are applicable to the organization.		

Table A.1 (*continued*)

Row	Subclause of this International Standard	Subclause of ISO 14001:2004	Element	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
4	6.3	4.5.2	Evaluation of compliance with the organization's legal and other requirements	Recognize that the organization is subject to legal and other requirements and that it needs to comply with them.	Identify and plan the methods used to monitor and measure compliance.	Periodically evaluate compliance with all legal and other requirements.	Record and report the results of the evaluation, including compliance and/or non-compliance with all legal and other requirements.	*For EMAS: Demonstrate legal compliance, including permits and permit limits, and have procedures to meet the requirements on an ongoing basis*	
5	6.4	4.2 (Environ-mental policy)	Preparation and implementation of an environmental policy	Recognize the need to have an environmental policy for the organization.	Prepare a preliminary environmental policy suitable for the organization. *For EMAS: The environmental policy should include a commitment for continual improvement of environmental performance*	Finalize the environmental policy document.	Make environmental policy available to the public. Make all those working for and on behalf of the organization aware of its content and meaning.		
6	6.5	4.3.3	Setting objectives and targets and establishing programme(s)	Recognize the need to establish and implement goals in order to improve performance.	Gather information which will enable objectives, target and programme(s) to be developed.	Develop and document objectives, target and programme(s) in order to improve performance.	Work towards achieving objectives and targets through the implementation of the programme(s). *For EMAS: The means to achieve the objectives and targets cannot be environmental objectives. For multi-site organizations, each of the sites should comply with all requirements of EMAS, including performance improvement*		

Table A.1 (*continued*)

Row	Subclause of this International Standard	Subclause of ISO 14001:2004	Element	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
7	6.6	4.4.6	Operational control	Recognize the need for controlling those operations associated with significant environmental aspects.	Plan the ways in which operations related to the organization's significant aspects are to be controlled.	Develop and implement the controls.	Review the effectiveness of the implemented controls.		
8	6.7	4.4.7	Planning for and responding to emergencies	Recognize that emergency situations may occur and need to be managed.	Identify which emergency situations may occur and their potential environmental impacts.	Establish a procedure that responds to the identified potential emergency situation.	Implement and test (where practicable) procedures that responds to the identified potential emergency situation.	Review the responses to emergency situation and revise the procedure if necessary.	
9	6.8	4.5.1, 4.5.2, 4.5	Environmental performance evaluation, including monitoring and measurement	Recognize the need to evaluate environmental performance and develop indicators for that purpose. *For EMAS: Specific requirements regarding key performance indicators* *Mandatory demonstration of the management system and audit procedures to address actual environmental performance* *For multi-site organizations, each site should comply with EMAS requirements (including continual improvement of environmental performance)*	Gather information on the key characteristics and define the performance indicators. *For EMAS: Specific requirements regarding key performance indicators*	Develop a procedure to monitor and measure in accordance with the environmental performance indicators of the organization. *For EMAS: Specific requirements regarding key performance indicators*	Collect, measure, analyse and evaluate performance of the organization. Calibrate equipment and retain records. *For EMAS: Specific requirements regarding key performance indicators*	Evaluate suitability of the indicators. *For EMAS: Any change of key performance indicators should be in line with respective requirements*	

Table A.1 (*continued*)

Row	Subclause of this International Standard	Subclause of ISO 14001:2004	Element	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
10	6.9	4.5.5	Internal audits	Recognize the need to ensure that the system is properly implemented and meets plan arrangement.	Gather information in order to develop the audit programme.	Plan and implement an audit programme.	Report audit findings to management and act upon them.	Identify improvements to internal auditing.	
11	6.10	4.5.3	Managing when things do not go as planned	Recognize that things can go wrong (nonconformity) and that action should be taken to correct and/or avoid their occurrence.	Identify what went wrong and correct it.	Analyse why it went wrong and identify actions to avoid re-occurrence.	Identify what could go wrong and take actions to prevent occurrence.	Review the effectiveness of corrective action(s) and take preventive action(s).	
12	6.11	4.6	Management review of progress and performance	Recognize the need to review the performance of an EMS.	Identify inputs to the review process.	Review the suitability, adequacy and effectiveness of the EMS. Identify improvement opportunities. Secure improvements of the system and/or actual performance.	*For EMAS: Performance of the organization against its objectives and targets should be evaluated as part of the management review process*		*For EMAS: Issue an environmental statement, meeting the minimum in A.2.2*
13	5.1	4.4.3	Environmental communications	Recognize the need and value of communicating on environmental issues.	Identify what will be communicated and to whom. For EMAS: Mandatory public availability of the Environmental Statement	Plan how information will be communicated with interested parties. For EMAS: Specific requirements regarding key performance indicators	Implement the communication process. For EMAS: Environmental performance should be easily and freely available (see specific requirements regarding language)	Monitor the results of communications to determine if they have been effective.	
14	5.2	4.4.1	Resources, roles, responsibility and authority	Recognize the need to have defined resources, roles, responsibilities and authority of top management of the organization and of implications of the EMS.	Identify and define the roles, responsibilities and appropriate resources within the organization.	Appoint a specific management representative for the EMS.	Communicate the roles and responsibilities to all those affected by them and ensure that they understand and agree with them. Assign the resources as needed.		

Table A.1 (*continued*)

Row	Subclause of this International Standard	Subclause of ISO 14001:2004	Element	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
15	5.3	4.4.2	Competence, training and awareness	Recognize the need to have competent personnel in the organization and awareness of implications of the EMS.	Determine the competence required for carrying out activities that relate to the organization's significant environmental impacts. Develop and implement an awareness procedure.	Develop and implement a training programme as necessary. Assess competence against the requirements and ensure that they are met.	Maintain the competence, training and awareness programme.	*For EMAS: Employee participation scheme required at all levels* *In particular, employees should be involved in: initial environmental review, establishment and implementation of management and audit system, environmental committees, joint working groups, and elaboration of the environmental statement*	
16	5.4	4.5.4	Records	Recognize the need to maintain records as evidence of its ongoing EMS.	Determine which records are required and establish an implemented procedure for their control.	Review and maintain records as necessary.			
17	5.5	4.4.4	Documentation	Within the scope of the EMS, recognize the need to have documentation.	Determine which documentation is needed.	Prepare and organize documentation.	Implement and maintain documentation.		
18	5.6	4.4.5	Document control	Within the scope of the EMS, recognize the need to have control with documentation.	Develop a procedure for the control of the documentation.	Prepare and organize documentation control.	Implement and maintain control of documents.		

Annex B
(informative)

Example of implementation in five phases

Figure B.1 shows an implementation of an EMS in five phases.

Phase 1 corresponds to the implementation of a specific project (see Clause 4).

Phases 2, 3, 4 and 5 correspond to a sequential implementation of the main elements of an EMS (see Clause 6).

The extent to which the supporting elements develop grows as the EMS is implemented. This is demonstrated by the shape of the triangle.

The extent to which the supporting elements are needed grows as the EMS is implemented. This is demonstrated by the increasing thickness of the connecting arrows.

NOTE When an organization has sufficient commitment to begin implementation of an EMS, it can start at phase 2.

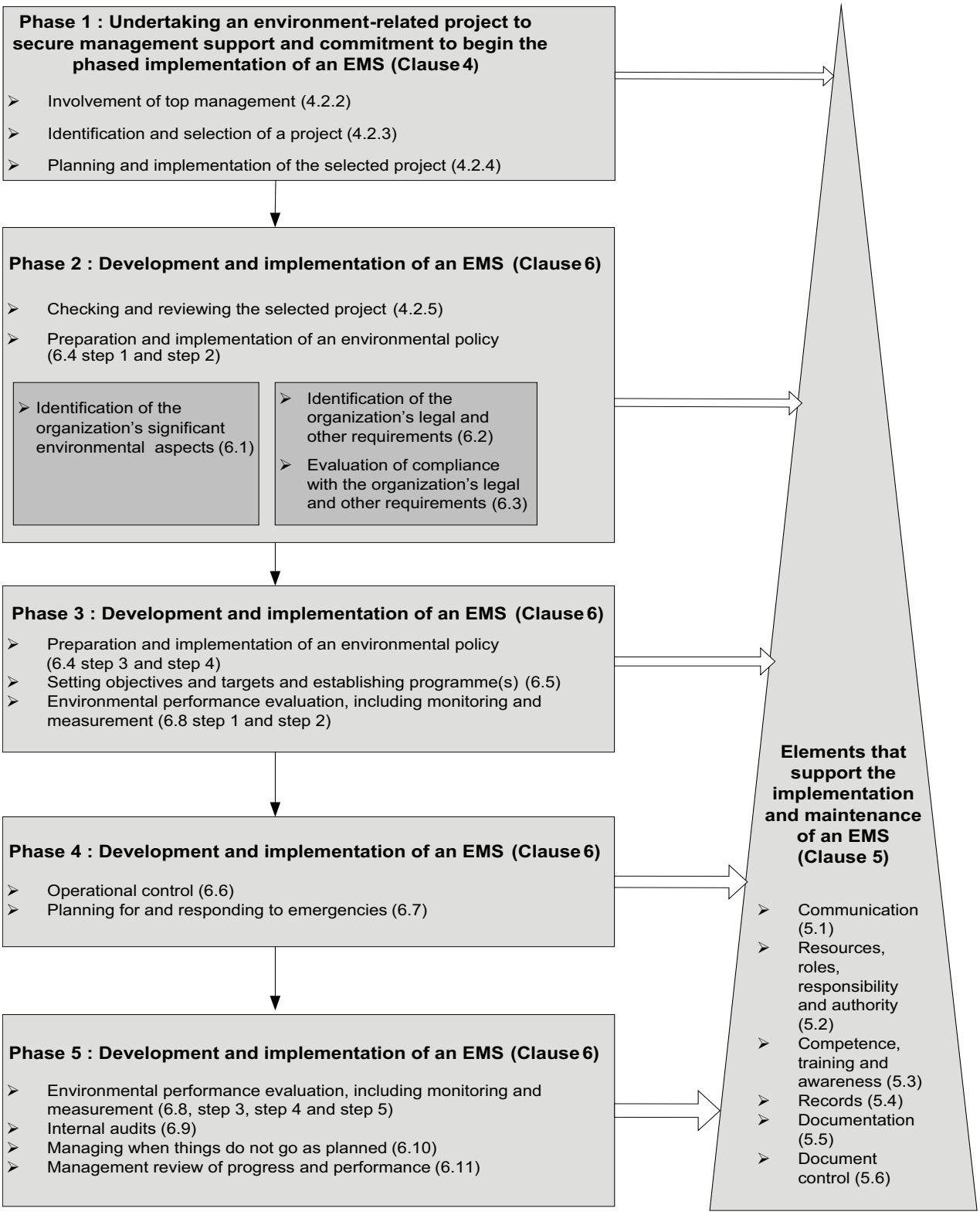

Figure B.1 — Example of implementation in five phases

Annex C
(informative)

Example of phased implementation in three phases

In the example in this annex (Table C.1), a company XYZ has decided to implement an EMS because they have been required to do so by their biggest customer. They have not previously identified any of their environmental issues. Having assessed the information and resources available, they have decided on this occasion to implement the EMS in the following three phases.

Each of the following phases is implemented in a loop, including a management review:

a) phase 1: identification of some environmental issues;

b) phase 2: planning for action and control;

c) phase 3: review and improvement of the EMS, including finalization of the supporting elements.

NOTE Supporting elements are, however, used in all phases.

Table C.1 — Example of implementation in three phases

Subclause of this International Standard	Activity	Step 1	Step 2	Step 3	Step 4	Step 5
6.1	Identification of the organization's significant environmental aspects	PHASE 1	PHASE 1	PHASE 2	PHASE 2	
6.2	Identification of the organization's legal and other requirements					
6.3	Evaluation of compliance with the organization's legal and other requirements			PHASE 3		
6.4	Preparation and implementation of an environmental policy					
6.5	Setting objectives and targets and establishing programme(s)					
6.6	Operational control		PHASE 2		PHASE 3	
6.7	Planning for and responding to emergencies					
6.8	Environmental performance evaluation, including monitoring and measurement		PHASE 3	PHASE 3	PHASE 3	
6.9	Internal audits					
6.10	Managing when things do not go as planned					
6.11	Management review of progress and performance	A part of each step in all phases (PHASE 1/2/3)				
5.1	Environmental communications			PHASE 3		
5.2	Resources, roles, responsibility and authority	PHASE 1	PHASE 3			
5.3	Competence, training and awareness		PHASE 2	PHASE 2	PHASE 2	
5.4	Records		PHASE 3	PHASE 3	PHASE 3	
5.5	Documentation					
5.6	Document control					

Annex D
(informative)

Example of a working EMS project

D.1 General

The example in this annex is taken from a working EMS project and aims to illustrate how all the various elements of a phased EMS implementation project fit together. This EMS example focuses on a limited number of operations and activities: a company-wide EMS would include a wider range of aspects and impacts, associated legislation and operational controls.

The manager and owner of XYZ, a small metal fabricating plant with 14 employees, including a process engineer, a supervisor, two administrative officers and 10 workers, wanted to see if an EMS would bring about overall environmental improvements to his company.

At a management team meeting, attention focused on a series of minor spills that had occurred in the chemical delivery and storage area. Although the spills represented a modest cost in loss of raw materials, the clean-up operation added substantially to the cost of waste disposal. Moreover, it was acknowledged that these incidents could have had a significant impact on the environment and were inconsistent with the plant's public policy commitment to prevent pollution of their property. Advice from the regional Association of Metallurgical SMEs also indicated that there was a legal requirement to report spills to the environmental regulatory agency.

Subclause	Activity	Step 1	Step 2	Step 3	Step 4	Step 5
6.4	Preparation and implementation of an environmental policy					
6.1	Identification of the organization's significant environmental aspects					

The management team recognized this was a serious issue and decided to initiate an environmental management project to address the problem. The supervisor, responsible for unloading operations, analysed past spills and found that each spill could have been prevented by the safeguards already installed. Five spills occurred with untrained employees, who had not made use of appropriate equipment such as drain covers; and the last occurred when one of the safeguards was improperly used. The team therefore agreed that their objective would be the elimination of spills.

Subclause	Activity	Step 1	Step 2	Step 3	Step 4	Step 5
6.5	Setting objectives and targets and establishing programme(s)					
6.2	Identification of the organization's legal and other requirements					

The first step was to raise environmental awareness among the four operators responsible for loading operations about the environmental impacts associated with the spills and to agree to an action plan to prevent further spillage. This was agreed on at a follow-up meeting with the four operators.

The manager set a programme to meet the objective, which included the following actions:

a) issuing of instructions to the operators to ensure adequate operational control by clearly defining how the loading and unloading procedure should be undertaken;

b) issuing a further instruction to ensure that, in the case of a spill (emergency situation), the equipment is properly located and ready to be used;

c) providing instructions on how to mitigate the impact and dispose of the waste;

d) informing the local authority of the spillage and actions taken. This instruction helped to ensure compliance with the relevant legal requirements;

e) drills were scheduled monthly; after a drill, the emergency procedures were reviewed. Only employees who had demonstrated to the supervisor their competency in these procedures were allowed to undertake loading and unloading work;

f) signage and photos were used to illustrate work instructions on how the safeguard equipment should be used.

Responsibilities were assigned and milestones defined.

Subclause	Activity	Step 1	Step 2	Step 3	Step 4	Step 5
6.5	Setting objectives and targets and establishing programme(s)					
5.3	Competence, training and awareness					
5.2	Resources, roles, responsibility and authority					
6.7	Planning for and responding to emergencies					

The operational controls included amending the unloading logbook, such that the operator could record whether the safeguards were in place or if they were not used, a justification for this. The logbook was reviewed weekly at the manager's meeting (i.e. manager, engineer and supervisor).

After two months, the records showed there had not been spills. However, the early morning operator had begun to omit using safeguards giving the reason “Insufficient time”. Action was taken to correct this in the form of reviewing the morning schedule and revising it to ensure that there was sufficient time. Preventive action was taken in the form of training all of the operators to notify their supervisor when there were operating problems that interfered with procedures.

The manager acknowledged the success of this environmental improvement project and decided to implement a full environmental management system and determine what further actions were needed.

Subclause	Activity	Step 1	Step 2	Step 3	Step 4	Step 5
6.6	Operational control					
5.4	Records					
6.10	Managing when things do not go as planned					
6.11	Management review of progress and performance					

D.2 Identification of significant environmental aspects and legal requirements

The manager and owner of XYZ decided to go for a full ISO 14001 EMS in his company, following the success of the environmental project.

Acknowledging his employees' experience of the company's processes, the owner organized a Saturday morning meeting at the plant and asked them to help him to identify all the environmental aspects and potential impacts related to the activities and products of XYZ. The team identified five categories in which activities, goods and products could produce an environmental impact, including:

— emissions to air, discharges to water and soil,

— noise, odours or light that could affect neighbours,

— use of goods and services,

— energy consumption (electricity, gas, fuel), and

— materials consumption (solvents, water and cleaning compounds).

The team reached a consensus on 12 environmental aspects that could lead to environmental impacts. Following a further meeting with the environmental advisor of the regional Association of Metallurgical SMEs, it was decided that five of those aspects could be considered significant and can produce significant impacts. These included: electric energy consumption, discharge of water to the drainage, noise produced by the four lathes (all three aspects in normal conditions) and a fire in the chemicals deposit and the spills dealt with by the first project (as potential emergency situations).

Legal requirements (including permits, report of spills, monitoring of emissions and other regulations) applicable to all the identified aspects were also discussed with the environmental advisor. Four applicable requirements were identified, including: noise to neighbours (mentioned in the association charter), report of spills, local fire regulations and discharge to the drainage.

The manager then prepared an aspects list, highlighting those that were significant, and a second list with all of the legal requirements, in which he included the “environmental charter” of the local association, to which he decided to voluntarily adhere as part of the EMS implementation.

The manager established a procedure to visit the environmental advisor every six months to review and update information related to the identification and evaluation of aspects and legal requirements. Details and results from these meetings were communicated to all employees.

Subclause	Activity	Step 1	Step 2	Step 3	Step 4	Step 5
6.1	Identification of the organization's significant environmental aspects					
6.2	Identification of the organization's legal requirements					

D.3 Environmental policy

Following the review of significant aspects, the manager prepared and documented a new environmental policy for XYZ which included the following company aims:

— intentions towards sound environmental care;

— commitment to comply with the legal regulations and the environmental charter of the Association of Metallurgical SMEs;

— prevention of pollution;

— continual improvement of the EMS.

The environmental policy was explained to all employees, with particular emphasis on the “prevention of pollution”, as defined in ISO 14001. Copies of the policy were placed in visible locations around the factory for the benefit of employees and visitors.

Subclause	Activity	Step 1	Step 2	Step 3	Step 4	Step 5
6.4	Preparation and implementation of an environmental policy					

D.3.1 Objectives, targets and programme

D.3.1.1 The next step was to ensure that XYZ was managing the significant aspects and to take further actions, where necessary.

In the case of the five significant aspects, XYZ established objectives (to improve or to maintain a certain level of performance):

Environmental aspect	Objective 2008
Energy consumption	Maintain it below 5 500 kWh
Discharge of water	Keep meeting regulations
Noise, triggered by the complaint of two neighbours	Reduce the level in the premises of the two closest neighbours up to 60 dB at night
Spills	Zero spills
Fire in the deposit of chemicals, triggered by a new requirement in the environmental charter of the local trade association	Comply with the environmental charter before September 2008

D.3.1.2 An environmental programme was developed and implemented to ensure improvement of two key objectives (noise and fire). The programme established the actions needed to meet the objective, the timetable and the resources needed, and the operators responsible for those actions.

Environmental programme for:

a) noise: identification of sources of noise, review and improve maintenance of four lathes, consider using sound barriers close to the machines, measure noise levels at neighbours' premises to verify objective was met;

b) fires: clear and detailed information of requirements, training of the personnel, a new calculation of “fire charge”, analysis of the material safety data sheet (MSDS) of the chemicals stored and procedures to ensure the continuous availability of the fire extinguishers.

The environmental programme is reviewed once a month by the supervisor and process engineer.

Subclause	Activity	Step 1	Step 2	Step 3	Step 4	Step 5
6.5	Setting objectives and targets and establishing programme(s)					
6.8	Environmental performance evaluation, including monitoring and measurement					

D.3.2 Operational control

The next step was to analyse how XYZ was managing those significant aspects which were not involved in improvement projects.

Aspect	Operational control
Energy consumption	The process engineer defined methods for using electric equipment and lighting and for the preventive and predictive maintenance of the four lathes, and communicated it to the personnel.
Drainage	An instruction clearly defined the process to operate the treatment plant to ensure the pH of industrial effluents met legal requirements; the instructions explaining the sequence of operations were signposted close to the set of valves.
Spills (first project)	Training of all personnel using signage and photos on the unloading and handling of chemicals using corresponding guidance from MSDSs.

Once a month, the manager, supervisor and process engineer reviewed operational control of these aspects, including:

— all measurement and monitoring activities;

— competence of all personnel involved;

— corrective actions, where required.

Subclause	Activity	Step 1	Step 2	Step 3	Step 4	Step 5
6.6	Operational control					
6.10	Managing when things do not go as planned					

D.4 Emergencies

XYZ identified two emergency situations relating to spills and fire protection.

In the case of spills, the process engineer is now required to:

— establish a routine to check the availability and the conditions of the safeguards;

— perform a drill every month to ensure that all personnel know how to react in the case of a spill;

— review the emergency procedure after each drill and after real emergencies.

The second potential emergency (a fire in the chemical deposit) is included in the EMS objectives and on completion of the programme, full legal compliance will be achieved. All employees will be trained in the application of the new emergency procedure.

Subclause	Activity	Step 1	Step 2	Step 3	Step 4	Step 5
6.7	Planning for and responding to emergencies					

D.5 Monitoring and measuring

The process engineer established a programme to monitor the activities related to the environmental aspects, including:

— composition of water discharged — once every week

— noise in and out the site — once every 6 months

— electricity consumption — monthly (invoice of local electricity supplier)

— status of the elements to respond to emergencies — monthly

— maintenance plan of the infrastructure — monthly

Noise measurements and water composition are subcontracted to a local laboratory, which provides the reports with the results together with calibration records of the equipment they used.

Achievement of objectives, established under the EMS, are also monitored monthly.

All reports are kept in the XYZ environmental logbook.

Subclause	Activity	Step 1	Step 2	Step 3	Step 4	Step 5
6.8	Environmental performance evaluation, including monitoring and measurement					
5.4	Records					

D.6 Environmental performance

The manager established a set of EPIs to monitor the company's commitment to environmental improvement, to promote environmental awareness and to compare XYZ with other companies.

The EPIs selected included:

— energy consumption (kWh/tn material processed);

— water consumption (litres/tn material processed)T;

— hours of training per employee;

— degree of compliance with the environmental programme (delays and costs).

These indicators are calculated yearly and reviewed during the management review process.

Subclause	Activity	Step 1	Step 2	Step 3	Step 4	Step 5
6.8	Environmental performance evaluation, including monitoring and measurement					

D.7 Internal audits

The owner and the engineer attended a two-day internal auditor course at the trade association, which helped them to develop a standard check for undertaking internal EMS audits.

An internal EMS audit is now undertaken once a year, one week before the planned management reviews.

If the result of an internal unit is not as expected, the owner can initiate additional internal audits to check that appropriate actions have been taken.

The audit report is analysed during the management review or, when appropriate, during the weekly meetings. These reports are kept in the XYZ environmental logbook.

Subclause	Activity	Step 1	Step 2	Step 3	Step 4	Step 5
6.9	Internal audits					
5.4	Records					

D.8 Managing when things do not go as planned

A special clause of the XYZ environmental logbook was established to record any deviation from the EMS requirements, incidents and accidents, complaints from external parties and the results of the internal audits.

For each entry, the process engineer should analyse the cause of the problem, take corrective action, take further action to prevent its recurrence and keep the corresponding records in the logbook.

This logbook is reviewed at the weekly meeting.

Subclause	Activity	Step 1	Step 2	Step 3	Step 4	Step 5
6.10	Managing when things do not go as planned					
5.4	Records					

D.9 Management review

During the weekly meeting, any environmental issue that needs attention is analysed and action is taken if necessary. Additionally, at the end of April each year, one weekly meeting is dedicated to the EMS management review. This review covers:

— results of internal audits and the evaluations of legal compliance, and the corresponding corrective and preventive actions;

— communication with external parties (e.g. local authorities and neighbours);

— the environmental performance of XYZ;

— follow-up actions from previous meetings;

— potential changes in regulations and in the business in general, which could affect the organization environmental performance;

— recommendations for improvement coming from any member of the company.

The process engineer prepares a brief report of the annual EMS review and the weekly meetings, with a summary of the key issues. This report is kept in the XYZ environmental logbook.

Subclause	Activity	Step 1	Step 2	Step 3	Step 4	Step 5
6.11	Management review of progress and performance					
5.4	Records					

D.10 Documents and records

The company EMS is fully described in an “EMS manual” which also includes figures and flow diagrams. The manual is kept in the supervisor's office and is available to all personnel.

All records are kept in the XYZ environmental logbook, which contains documents such as:

a) list of environmental aspects;

b) list of legal requirements;

c) environmental programme;

d) evaluations of legal compliance;

e) training records;

f) communications;

g) other records mentioned previously.

Subclause	Activity	Step 1	Step 2	Step 3	Step 4	Step 5
5.5	Documentation					
5.6	Document control					
5.4	Records					

Annex E
(informative)

Cross-reference table

4	**Undertaking an environment-related project to secure management support and commitment to begin the phased implementation of an EMS**	**Clauses, subclauses and annexes of International Standards**
4.1	Purpose	
4.2	Methodology	
4.2.2	Involvement of top management	ISO 14001:2004, 4.5 (Checking)
4.2.3	Identification and selection of a project	
4.2.4	Planning and implementation of the selected project	ISO 14001:2004, 4.3 (Planning) ISO 14001:2004, 4.4 (Implementation and operation) ISO 14004:2004, 4.3 (Planning) ISO 14004:2004, 4.4 (Implementation and Operation
4.2.5	Checking and reviewing the selected project	ISO 14001:2004, 4.6 (Management review) ISO 14004:2004, 4.6 (Management review) ISO 14001:2004, A.1 (General requirements) ISO 14004:2004, 4.1.4 (Initial environmental review)
5	**Elements that support the implementation and maintenance of an EMS**	
5.1	Environmental communications	ISO 14001:2004, 4.4.3 (Communication) ISO 14004:2004, 4.4.3 (Communication) ISO 14031:1999, 3.3.5.2 (Internal reporting and communication) ISO 14031:2000, 3.3.5.3 (External reporting and communication)
5.2	Resources, roles, responsibility and authority	ISO 14001:2004, 4.4.1 (Resources, roles, responsibility and authority) ISO 14004:2004, 4.4.1 (Resources, roles, responsibility and authority) ISO 14031:1999, 3.3.5.2 (Internal reporting and communication)
5.3	Competence, training and awareness	ISO 14001:2004, 4.4.2 (Competence, training and awareness) ISO 14004:2004, 4.4.2 (Competence, training and awareness) ISO 14031:1999, 3.3.5.2 (Internal reporting and communication)
5.4	Records	ISO 14001:2004, 4.5.4 (Control of records) ISO 14004:2004, 4.5.4 (Control of records)
5.5	Documentation	ISO 14001:2004, 4.4.4 (Documentation) ISO 14004:2004, 4.4.4 (Documentation)
5.6	Document control	ISO 14001:2004, 4.4.5 (Control of documents) ISO 14004:2004, 4.4.5 (Control of documents)

6	Development and implementation of an EMS	
6.1	Identification of the organization's significant environmental aspects	ISO 14001:2004, 4.3.1 (Environmental aspects) ISO 14004:2004, 4.3.1 (Environmental aspects)
6.2	Identification of the organization's legal and other requirements	ISO 14001:2004, 4.3.2 (Legal and other requirements) ISO 14004:2004, 4.3.2 (Legal and other requirements)
6.3	Evaluation of compliance with the organization's legal and other requirements	ISO 14001:2004, 4.5.2 (Evaluation of compliance) ISO 14004:2004, 4.5.2 (Evaluation of compliance)
6.4	Preparation and implementation of an environmental policy	ISO 14001:2004, 4.2 (Environmental policy) ISO 14004:2004, 4.2 (Environmental policy)
6.5	Setting objectives and targets and establishing programme(s)	ISO 14001:2004, 4.3.3 [Objectives, targets and programme(s)] ISO 14004:2004, 4.3.3 [Objectives, targets and programme(s)] ISO 14031:1999, 3.3.3 (Analysing and converting data) ISO 14031:1999, 3.3.4 (Assessing information)
6.6	Operational control	ISO 14001:2004, 4.4.6 (Operational control) ISO 14004:2004, 4.4.6 (Operational control) ISO 14031:1999, 3.3.5.2 (Internal reporting and communication)
6.7	Planning for and responding to emergencies	ISO 14001:2004, 4.4.7 (Emergency preparedness and response) ISO 14004:2004, 4.4.7 (Emergency preparedness and response)
6.8	Environmental performance evaluation, including monitoring and measurement	ISO 14001:2004, 4.5.1 (Monitoring and measurement) ISO 14004:2004, 4.5.1 (Monitoring and measurement) ISO 14031:1999, 3.3.2 (Collecting data) ISO 14031:1999, 3.2.2 (Selecting indicators for EPE)
6.9	Internal audits	ISO 14001:2004, 4.5.5 (Internal audit) ISO 14004:2004, 4.5.5 (Internal audit) ISO 14031:1999, 3.3.2 (Collecting data) ISO 14031:1999, 3.3.5.2 (Internal reporting and communication)
6.10	Managing when things do not go as planned	ISO 14001:2004, 4.5.3 (Nonconformity, corrective action and preventive action) ISO 14004:2004, 4.5.3 (Nonconformity, corrective action and preventive action) ISO 14031:1999, 3.3.5.2 (Internal reporting and communication)
6.11	Management review of progress and performance	ISO 14001:2004, 4.6 (Management review) ISO 14004:2004, 4.6 (Management review) ISO 14031:1999, 3.3.5.2 (Internal reporting and communication) ISO 14031:1999, 3.4 (Reviewing and improving EPE)

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