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Environmental Management Systems

Tine Herreborg Jørgensen and Arne Remmen

The aim of this chapter is to present environmental management systems (EMS) as a way to systematically reduce environmental impacts of organisational activities. The chapter focuses on the application of EMS in industry. The first part is an introduction to the principles of EMS according to ISO 14001 and EMAS, and to the diffusion of EMS. In the second part it is analysed how EMS can be interpreted and understood in different ways, which among other things influence the way EMS is implemented in organisations. Finally, in the third part it is examined, how management systems such as ISO 9001 and ISO 14001 can be integrated with different levels of ambition.

Background of EMS

During the past couple of decades, the industrial development and the global character of environmental problems have resulted in increasing demands on industry. Companies are impelled to take responsibility for the environmental damage they create and to manage the environment in a more systematic and proactive way (Welford, 1998).

Environmental concerns are incorporated in different types of business strategies and disciplines from product development over accounting to marketing in order to meet environmental demands from stakeholders. Environmental management is a kind of self-regulation by a company in relation to their environmental impacts, and results in a demand for systems and tools to support reliability and to facilitate the development of cleaner production processes and products. Implementation of EMS is one way of securing continuous improvements of the environmental performance.

History of EMS standards

The British Standard, BS 7750 "Specification for Environmental Management Systems", was published in 1992 and other countries followed with similar standards or handbooks for EMS. BS 7750 was applied as basis for the first certification of EMS in several countries.

In 1993, an EU regulation for "Eco-Management and Audit Scheme" (EMAS) was published. The aim of EMAS was to assess and improve the environmental effort and performance of organisations, and provide relevant information to the public and other stakeholders. The second, updated edition of EMAS was published in 2000 (European Commission, 2001).

An ISO technical committee TC 207 was established in late 1992. The aim was to develop international standards for environmental management systems, life cycle assessment, environmental labelling and methods for evaluation and audit. In December 1996, ISO 14001 was published as the first international environmental standard and replaced national standards for EMS during a transitional period. The second edition of ISO 14001 "Environmental management systems – Requirements with guidance for use" was published in 2004 (ISO, 2004). The related standard ISO 14004 "EMS – General guidelines on principles, systems and supporting techniques" was published in 1997 and the second edition in 2005. The majority of participants in committee TC 207 are industry representatives, which is probably why some demands in EMAS are stricter. The differences will be commented later in this chapter. In general, when reference is made to ISO 14001 it is the latest version from 2004.

Definition and purpose of EMS

In ISO 14001:2004, EMS is defined as *"part of an organization´s management system used to develop and implement its environmental policy and manage its environmental aspects"*. The requirement in order to be certified is: *"The organization shall establish, document, implement, maintain and continually improve an environmental management system in accordance with the requirements of this International Standard and determine how it will fulfil these requirements"*. (ISO, 2004)

The motives behind organisations' implementation of EMS vary among trades and from industrialised to developing countries. In industrialised countries with a long tradition for environmental regulation companies often implement EMS to prove their reliability towards stakeholders. In developing countries a certified EMS is becoming a precondition in many cases for export to business partners in industrialised countries.

ISO 14001 have a number of potentials for an organisation (inspired by ISO, 2002a and ISO, 2004):

- A structured approach to addressing the environmental bottom line
- Improved management of the environmental impacts of the activities
- Continuous improvement of environmental performance
- Emphasis on prevention rather than corrective action
- Management commitment to meet policies, objectives, and targets
- Addresses also the environmental aspects of products and services, as well as enables access to a growing "green" market place

Especially, the last point can be questioned based on the experiences with ISO 14001 so far. In general, the extent to which the organisation is able to achieve the potentials above depends on management commitment, level of ambition and priority of resources to establish the relevant activities.

Principles of ISO 14001

The standard is based on the methodology known as Plan-Do-Check-Act (PDCA) and is illustrated as an iterative process with continuous improvements, see figure 1. Plan is to establish objectives and processes to deliver results in accordance with the environmental policy. Do is to implement the processes. Check is to monitor and measure processes against environmental policies, objectives, targets, legal and other requirements, and report the results. Act is taking action to continually improve performance of the EMS (ISO, 2004).

The standard can be applied by various organisations that have their own functions and administration. This includes companies, corporations, firms, enterprises, authorities and institutions; and both private and public organisations are included. ISO 14001 has an Appendix A with guidance to organisations with useful examples of for instance environmental aspects.
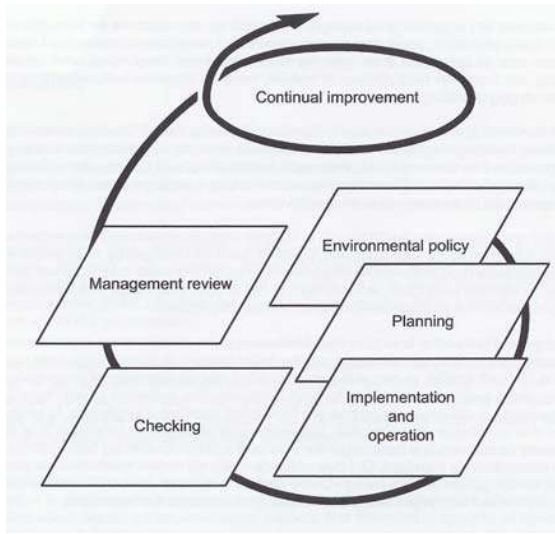
Figure 1: *Environmental management system (ISO 14001:2004)*

Environmental policy

The top management shall define the environmental policy in order to reflect management commitment. The demands to the environmental policy are summarised in table 1 (see also paragraph 4.2 in ISO 14001). Management commitment and priority of resources and time to run the system on a daily basis is a precondition for a well functioning management system.

Environmental policy	**Within the defined scope of its EMS the policy must be / include:**
	- Appropriate to environmental impacts of its activities, products and services, - Commitment to continual improvement and pollution prevention - Commitment to comply with legal and other requirements related to its environmental aspects - Framework for setting and reviewing environmental objectives and targets - Must be documented, implemented and maintained - Communicated to all persons working for the organisation - Is available to the public

Table 1: *Environmental policy – different aspects (inspired by ISO 14001)*

The environmental policy is the only element in the system, which the organisation has to make publicly available.

Planning

The organisation must ensure the significant environmental aspects are taken into account, when establishing, implementing and maintaining EMS (see table 2, and paragraph 4.3 in ISO 14001). The identification of significant environmental aspects is limited to "the defined scope of the EMS that it can control and those that it influence taking into account planned or new developments, or new or modified activities, products and services" (ISO 14001).

Planning	*Establish, implement and maintain procedures and documentation to:*
Environmental aspects	• Identification of environmental aspects of its activities, products and services. • Determine those aspects with a significant environmental impact
Legal and other requirements	• Identification and access to applicable legal requirements and other requirements to which the organisation subscribes • Determination of how these requirements apply to the environmental aspects.
Objectives, targets and programme(s)	• Determine objectives and targets for relevant functions and levels within the organisation. • Designation of responsibility for achieving objectives and targets. • Means and time-frame by which they are achieved.

Table 2: *Environmental planning – main issues (inspired by ISO 14001).*

In practice, identification of environmental aspects and of compliance with legal requirements should be considered before the formulation of an environmental policy in order to have this overview as basis for the policy.

The significant environmental impacts identified and legal requirements create the basis for determining objectives and targets. The objectives and targets should be specific and measurable where practicable and cover both short- and long-term issues. Measurable targets are important in order to document achieved reductions in environmental impacts and to document continuous improvements of the environmental performance. In practice, objectives are long-termed like reduction of energy consumption, while targets are short-termed and specific: e.g. 10% reduction in energy consumption in the manufacturing process in 2005 compared to the previous year.

Implementation and operation

The structure of EMS is established in this phase and is a platform in order to meet the formulated objectives and targets (see table 3, and paragraph 4.4 in ISO 14001). Top management shall define roles, responsibility and authority to ensure that EMS is in accordance with ISO 14001. Management

shall also ensure availability of resources for establishment, implementation, maintenance and improvement of EMS, which include human resources, specialised skills, organisational infrastructure, technology and financial resources.

Implementation and operation	Establish, implement and maintain procedures and documentation to:
Resources, roles, responsibility and authority	• Ensure availability of resources essential to the EMS. • Define roles, responsibilities and authorities. • Ensure the EMS is established, implemented and maintained in accordance with the requirements.
Competence, training and awareness	• Ensure that persons performing tasks with potential of causing significant environmental impacts are competent and have appropriate education, training or experience. • Persons must be aware of the importance of conformity with environmental policy, the significant environmental aspects and benefits of improved personal performance. Also roles and responsibility and potential consequences of divergence from specified procedures.
Communication	• Internal communication at various levels and functions. • Receiving, documenting and responding to external communication from interested parties.
Documentation	• Document environmental policy, objectives and targets. • Description of the scope and main elements of EMS and their interaction. • Documents necessary to ensure effective planning, operation and control of processes related to the significant aspects.
Control of documents	• Approval, review and update documents • Changes must be identified and relevant versions must be available at point of use. • Ensure the documents remain legible and identifiable.
Operational control	• Control situations where their absence could lead to deviation from the policy, objectives and targets • Stipulate the operating criteria • Communicate applicable procedures and requirements to suppliers, including contractors.
Emergency preparedness and response	• Identify potential emergency situations and potential accidents that can have an impact on the environment. • Periodically review its emergency preparedness and response procedures, in particular after the occurrence of accidents or emergency situations.

Table 3: *Implementation and operation (inspired by ISO, 14001).*

The organisation shall decide whether it wants to communicate externally about significant environmental aspects and document this decision. Methods for external communication shall be established in that case.

Checking

In order to register, monitor and control the environmental performance in relation to the policy, objectives and targets it is necessary with a number of procedures to secure this. The elements in the phase of checking have to be recorded in order to document results of monitoring and measurement, evaluation of compliance, nonconformity, corrective and preventive actions (see table 4, and paragraph 4.5 in ISO 14001).

Checking	Establish, implement and maintain procedures and documentation to:
Monitoring and Measurement	• Monitor and measure key characteristics of operations that can have a significant environmental impact. • Calibrated or verified monitoring and measurement equipment must be used and maintained.
Evaluation of Compliance	• Periodically evaluating compliance with legal and other requirements and keep records of the results.
Nonconformity, Corrective action and preventive action	• Identify and correct nonconformity. Investigate and determine their cause and take action to avoid recurrence. • Evaluate need for action to prevent nonconformity and implement appropriate action to avoid occurrence. • Record the results and review the effectiveness of corrective and preventive actions.
Control of records	• Establish and maintain records to demonstrate conformity to requirements in the EMS and results achieved. • Records shall remain legible, identifiable and traceable.
Internal audit	• Determine whether EMS conforms to planned arrangements and is properly implemented and maintained • Provide information of results of audits to management • Audit programme and procedures shall address responsibilities and requirements for planning and conducting audits, reporting results and retaining associated records. • Determine audit criteria, scope, frequency and methods • Selection of auditors and conduct of audits shall ensure objectivity and impartiality of the audit process.

Table 4: *Checking – different issues (inspired by ISO 14001).*

Identification of nonconformity and implementation of corrective and preventive actions are key elements to prevent repetition of nonconformities and to secure improvements of the system.

Management review

The aim of the management review is to ensure continuous suitability, adequacy and effectiveness of EMS and must be performed by top management (see table 5, and paragraph 4.6 in ISO 14001). The management review is

the last principle in EMS and shall include assessing opportunities for improvements and need for changes of EMS.

Management review	The input to management review shall include:
	• Results of internal audits and evaluations of compliance with legal and other requirements. • Communications from external interested parties. • The environmental performance of the organisation. • Extent to which objectives and targets have been met. • Status of corrective and preventive actions. • Follow-up actions from previous management reviews. • Changing circumstances, including developments in legal and other requirements related to its environmental aspects. • Recommendations for improvements.

Table 5: *Management review (inspired by ISO 14001).*

To be consistent with the commitment to continuous improvement, the outcome from the reviews shall include decisions and actions related to possible changes to environmental policy, targets and other elements of EMS.

A number of procedures are formulated to secure that the different requirements of EMS are followed. A procedure should contain its purpose and the overall principles or areas of validity. Who is responsible for formulating the procedure, keep it up to date and secure compliance should also be included. The procedure describes the usual practise and co-ordination with focus on:

- What brings the procedure into action
- What is carried out and co-ordinated
- Criteria for good/bad
- Action if deviation
- Where action is documented

References to further documentation could be instructions, formula, legislation / rules, approvals in force, archives.

Certification of EMS

In order to become certified EMS must be verified by an external body, who is accredited by a national competent body. Benefits of a certification can be:

- Public demonstration of due diligence
- Enhanced corporate image
- Accountability

- Ensures management commitment
- Drives forward improvement processes
- Staff motivation

One or two lead auditors typically carry out a verification process. The lead auditor reviews the documentation of the organisation's EMS, compares it with the standard and prepares the audit programme. The certification audit consists of interviews, examinations and observations in the organisation.

In the certification process the lead auditor review issues such as: does the system cover the significant environmental aspects and impacts, and does the organisation comply with the standard? Is EMS implemented and integrated in practise and management? The organisation will not be certified if the system is only formulated in written documents. The lead auditor observes whether EMS is working in practise and conducts interviews with employees at all levels to assess their knowledge and awareness of the relevant parts of the system. The lead auditor conducts an external audit every year. Every third year a recertification takes place.

A number of organisations have chosen to implement ISO 14001 without seeking third party certification. Especially, small and medium sized enterprises find it often too expensive to commit to certification, and want at the same time a simple system with focus on improvements of performance.

EMAS versus ISO 14001

The EU regulation EMAS was revised in 2000 as mentioned earlier in this chapter. This revision made it easier for organisations to interpret the regulation and to get an overview of the similarities and differences compared to ISO 14001. Today most of the companies that implement EMAS take their point of departure in ISO 14001:2004 and add extra elements to comply with EMAS. The main differences are that EMAS demands:

- Initial environmental review (just a recommendation in ISO 14001)
- Public environmental statement
- The actual environmental performance is assessed in both internal audit and management review. ISO 14001 demands that the organisation assess whether the system works
- Suppliers and those who work on behalf of the organisation shall comply with the environmental policy. ISO 14001 only demands that they have knowledge about the policy.
- Measurable environmental improvements year by year. ISO 14001 demands continuous environmental improvements and pollution prevention.

The Regulation lists the minimum requirements for the environmental statement in Annex III, point 3.2. The environmental statement has to include a description of environmental policy and EMS; significant environmental impacts; objectives and targets; data on environmental performance; year-by-year comparison of environmental performance; legal compliance, accreditation number and date of validation.

EMAS makes a distinction between direct and indirect environmental aspects. The indirect aspects occur "as a result of the activities, products and services of an organisation there may be significant environmental aspects over which it may not have full management control". The organisation shall consider how much influence it has over the indirect environmental aspects, and what measures can be taken to reduce the impact In EMAS, Annex VI examples of indirect aspects are given (paragraph 6.3, p. 26 European Commission, 2001). For instance product-related issues could be design, development, packaging, transportation, use and waste recovery/disposal. The environmental performance and practices of contractors, subcontractors and suppliers could also be relevant (European Commission, 2001).

The indirect aspect can be significant for an organisation. For instance a consultancy firm in the field of construction has a major influence on the extent to which environmental considerations are included in the design, planning, construction and use of a building. On the contrary, the direct environmental aspects from the consultancy firm are limited and would be related to their administration, office work and transportation. This is the focus of life cycle management, which is presented and discussed in chapter 14.

EMAS demand the environmental statement to be accredited by an external verifier, registered and publicly available. In practise, the same certifying bodies are doing the external verification for ISO 14001 and EMAS. EMAS become registered instead of certified because it is a regulation. In June 2005, 4,221 sites in 3,160 organisations were registered according to EMAS (European Commission, 2005).

Internationally, the majority of organisations with EMS choose ISO 14001 in preference to EMAS. ISO 14001 is more popular than EMAS. The reasons could be:

- ISO 14001 is an international standard (EMAS is EU regulation)
- Clear cross references and improved compatibility with ISO 9001 (quality management system)
- EMAS is more resource demanding due to the publication of an externally verified environmental statement, which also demands openness from the company regarding its performance.

Some organisations with an ISO 14001 certificate choose to publish an environmental statement/report on a voluntary basis. This is especially the case for larger organisations that want to inform their stakeholders about the environmental performance. Environmental reporting is further discussed in chapter 9 and 10.

Diffusion of EMS

ISO 14001 is an international standard applied in many different types of organisations. The standard does not, and is not intended to contain many specific requirements (Bell, 1997). ISO 14001 is a framework that companies are obliged to adopt in their organisation. However, the standard does not specify how the requirements should be met and they do not provide an indication of what goals it should strive to achieve (Schaltegger, Burritt and Petersen, 2003). ISO 14001 is a process standard not a performance standard, which means that the standard does not set up specific demands of environmental improvements. IS0 14001 is flexible with room for interpretations, such as implementation strategies, definition of scope, environmental improvements, internal and external dialogues and co-operation.

EMS according to ISO 14001 can be considered as a 'travelling concept' at national and international levels where ISO 14001 is appropriated to different contexts (Jørgensen, 2004). EMS is shaped due to conditions, such as:

- Interests and demands of various stakeholders
- Regulatory framework
- Market structure
- Organisational identity
- Educational systems
- Accreditation bodies
- Available equipment and production facilities

Not only ISO 14001 is translated from one language to another. When travelling the whole concept and understanding of the environment is translated and transformed in order to apply to a new context.

Figure 2 shows the development in the number of issued certifications. Internationally, implementation of ISO 14001 has increased since 1995. By December 2003 66,070 companies covering 113 countries had become certified according to ISO 14001 (ISO, 2004). The number certificates increased with 60% from 2000 to 2001, and with 34% from 2002 to 2003 (ISO, 2004).
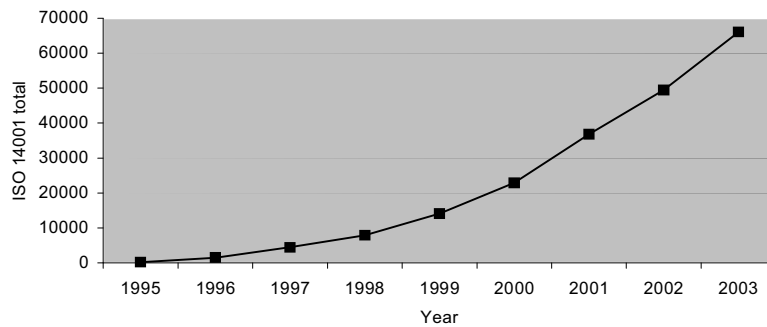
Figure 2: *ISO 14001 certificates in the world (ISO, 2003 and ISO, 2004)*

A look on the share of ISO 14001 certificates in different parts of the world shows that Europe (48%) and Far East (36%) together holds 84% of the certificates (see table 6). Other regions have had a slow beginning. From 1996 to 2004 the number of ISO 14001 certificates has increased every year in all different parts of the world. Especially Europe's share is slowly decreasing, while the other regions increase their share of the certificates.

Region	*1997 (%)*	*1999 (%)*	*2001 (%)*	*2003 (%)*	*Total number of certificates (31 Dec. 2003)*
Africa/West Asia	1.7	2.4	2.5	3.0	1,995
Central / South America	2.2	2.2	1.9	2.6	1,691
North America	2.6	6.9	7.4	7.9	5,233
Europe	59.2	52.2	49.6	48.4	31,998
Far East	30.6	30.8	34.8	35.9	23,746
Australia/ New Zealand	3.7	5.5	3.9	2.1	1,407

Table 6: *Share of ISO 14001 certificates in different regions (ISO, 2004).*

Understanding Management Systems and Implementation Strategies

So far, EMS has been described according to the standards and to its worldwide diffusion. A closer examination of the standards for management systems and how they have changed over time reveals that the different standards have been based on different organisational understandings, and accordingly of how to implement management systems in organisations.

As described (see chapter 2), EMS is part of a change from pollution control and abatement towards pollution prevention. In the case of quality management the same change has taken place from quality control via statistical analysis towards quality systems and management. In textbooks on quality management the old versions of ISO 9000 have always been illustrated as a pyramid – symbolising a *stable* organisation with clear policies, procedures and instructions on the strategic, tactic and operational levels. The bureaucratic organisation is concerned with producing the same quality every time. Therefore, ISO 9000 was often criticised for being static, resulting in too much paperwork and having too much focus on the system (Barnes, 1998; Huxtable, 1995).

The criticism from Total Quality Management was especially stressing the importance of top management commitment, employee participation as well as creating a quality culture. This criticism was already partly reflected in 1996 in the ISO 14001 standard, which has always been illustrated as a spiral with focus on the *iterative process* of concurrent activities such as policy, planning, implementation, etc. in order to create continuous improvements. This dynamic understanding of organisations fits well with the need for process and product innovations in most industries, and for the moment, this understanding seems to be the turning point for formulation of standards (Remmen, 2003).

These changes during the past decades can partly be seen as a gradual learning process among enterprises, consultants, standard organisations, etc. as the limitations of earlier approaches became evident: quality control is better than customer complaints. Prevention via procedures and instructions is better than final inspections of the product. Continuous quality improvements are better than a guarantee of the same product quality every time.

In other words, the understanding of quality and environmental management has gradually changed from reactive control over systems with a proactive focus towards management processes with the aim of continuous improve-

ments of the performance in interaction with stakeholder. Each tradition has its own journals, conferences, etc., and main differences can be summarised as in table 7.

	CONTROL - Monitoring	SYSTEM - Certification	MANAGEMENT - Processes
Con-tent	• Rules • Measurements and data collection • Documentation	• Procedures and instructions • System structure • Standards	• Strategy and policies • Continuous im-provements
Focus	• Reactive • Corrective actions • Problems	• Proactive • Prevention • Objectives	• Interactive • Engagement with stakeholder

Table 7: *Various approaches of quality and environmental management (inspired from Remmen 2003)*

The development from a focus on structure and systems towards attention to changes and processes can also be characterised as a move from "doing things right" to "doing the right things". However, the relation between system and process is not a question of neither-nor. On the contrary, the system elements of procedures and instructions can be regarded as the stabilising parts of organisations, which secure the dynamic and generic processes of co-ordination and continuous improvements of performance.

How organisations are understood and how the purpose of the management system is defined and interpreted has an overall influence on the choice of implementation strategy, and consequently also on how and to what degree the management system is embedded in organisations.

Organisations have to consider how implementation of the management system is organised. Who is in charge of the implementation? – A manager, a project group or a combination? Other organisational questions to consider are for instance: who participates and how are they contributing to the implementation? Does the organisation need assistance of consultants, etc.? During the implementation the organisation has to be adjusted and responsibilities defined. Commitment of top management and employees is necessary to anchor the system in the organisation. Employee participation is further described and analysed in chapters 7 and 8.

To what degree the organisation can establish a dynamic management system that can keep up momentum depends to some extent on the choice of implementation strategy. Among possible strategies two different exist at each end of the spectrum.

In the *expert* strategy, the consultants write down all procedures and instructions, make suggestions for environmental policy, targets etc., and the managers and the employees are only participating to a very limited extent. This approach has a primary focus on the system and a secondary focus on improvements of the environmental performance, and the practical activities in environmental management. The result is that the organisation "receives" a system, which is not adapted to its specific conditions and that the system has not become an integrated part of the decisions and daily practice in the organisation.

In the other end of the spectrum is the *participatory* strategy. In this case an active participation of managers and employees is the corner stone in the implementation during which they build up their understanding of the system via "learning by doing". Managers and employees collaborate on the preparatory review, determination of environmental policy, environmental targets, etc. Environmental improvements are made during the implementation in order to increase the environmental consciousness and motivation, and in order to learn how to collaborate and achieve improvements systematically. With this strategy the organisation experiences the purpose of the environmental management system in practice during the implementation and has already a dynamic and rooted approach towards continuous improvements before the system is certified.

The organisations must be aware of the consequences of the chosen implementation strategy. If the organisation has no tradition for pollution prevention, then environmental improvements during the implementation can be a way to anchor the management system and to secure employee participation. This approach may initiate a dynamic process and is more likely to create a flexible, unbureaucratic system adapted to the organisation.

The implementation of environmental management systems is part of a shift *from* a reactive environmental strategy with focus on complying with regulations and achieving cost savings, *towards* a proactive environmental strategy with the purpose of being ahead of regulations, obtaining strategic advantages, and being among the best in the trade of industry.

Instead of seeing this as a shift, it is rather a question of being orientated in both directions. Proactive companies with visionary policies and engaged employees have increased their capacity to pick up new signals.

A basic condition for a management system is a shared understanding of organisations and how they operate. This is also the case when it comes to the debates regarding an integrated management system (IMS).

Integrated management systems

The development of several standards for management systems such as ISO 9001, ISO 14001 and OHSAS 18001 covering different aspects of the organisation has created a trend towards integration of the different standards. The integration can be made on different ambition levels.

During the past five years, revisions of ISO standards have created a path towards more *compatible* management standards with cross references and 'integration' of system elements, which can reduce confusion and lead to administrative benefits related to system implementation and maintenance. However, compatibility is only a small step towards an integrated management system. A prerequisite for integration is an understanding of generic processes and tasks in the *management cycle* – the plan-do-check-act, and the potential benefits of such an integration is related to internal co-ordination and the reduction of possible trade-offs. A more ambitious level of integration is to *create a culture* of learning, stakeholder participation and continuous improvement of performance. To reach this ambition, focus of the management system has to be on the synergy between customer-based quality, product-oriented environmental management as well as corporate social responsibility.

In other words, three levels of integration can be distinguished:

a. **Corresponding**: increased *compatibility* with cross-references between *parallel systems*
b. **Co-ordinated & coherent**: *generic processes* with focus on tasks in the *management cycle*
c. **Strategic & inherent**: an organisational *culture of learning*, *continuous improvements* of performance and *stakeholder involvement* related to internal and external challenges.

These three levels of integration also involve different potential benefits *from* reduction of administrative burdens *over* improved internal co-ordination *to* competitive advantages and a step towards corporate responsibility related to all three pillars of sustainable development.

The trend towards increased compatibility and the generic approach to integration with focus on the common processes will be described briefly, while the embedded and strategic understanding of integration is explained in more detail to underline an organisational approach to management systems.

Towards compatible standards
– focus on system aspects

Liability in connection with quality, environment, occupational health & safety as well as social accountability is important for the competitiveness and image of organisations. Certified management systems covering these areas are an indication of responsibility and concern for stakeholder relations. Four different standards for management systems are especially relevant in connection with an integrated system:

- Quality management systems (ISO 9001)
- The old ISO 9000 series from 1987 had a system focus on enabling the enterprises to produce the same quality every time by specifying the policy, procedures and instructions in a quality handbook. With the revision of ISO 9001 in 2000, the focus on customers and continuous improvements became stronger.
- Environmental management systems (ISO 14001).
- Occupational health & safety management system (OHSAS 18001)
- OHSAS 18001 from 1999 can be described as a de facto standard used as basis for certification of occupational health and safety management systems.
- Management of social accountability (SA 8000)
- SA 8000 is from 1997 and was developed by the association Social Accountability International. The aim of SA 8000 is to protect the rights of the employees. It is based on international conventions regarding human rights, child labour, forced labour, health and safety, freedom of association, freedom from discrimination, disciplinary practices, work hours, compensation and management practices.

With the relatively new editions of the different standards, the management systems have an increased number of similarities and improved correspondence. Compatibility, cross-references and internal co-ordination of the elements in the management system are obvious first steps. Cross-references can reduce the add-on problems of different parallel management systems in one organisation, e.g. confusion between demands of different standards. ISO guide 72 is intended to improve the link between the standards developing committees and the markets they serve, and to make optimal use of resources by only developing management system standards for which there is a market requirement (ISO, 2002b).

From an administrative viewpoint, clear cross-references are appropriate between the different management systems, and with the potential benefits:

- Minimisation of documentation and records
- Less bureaucracy and reduction of paperwork
- Cost savings by optimisation of time and resources assigned to maintenance of the systems
- Simplification of internal and external audits

ISO considers ISO 9001 and ISO 14001 generic standards in the sense that these standards can be applied to any organisation in any sector. It can and has been questioned if "one shoe fits all", and especially small and medium-sized enterprises have introduced simple management systems but without external certification (Miljøstyrelsen, 2004), (Miljøministeriet, 2004). However, in relation to integration, a deeper look into the standards seems more interesting: what are the generics of the generic standards?

Generic systems
– focus on processes of co-ordination

An increase in the compatibility of each standard is a basic platform towards an IMS. A step further is a common understanding of the *processes* of co-ordination within an organisation and the tasks involved in management. In other words, an IMS must also be based on the generic aspects of management: policy, planning, implementation, corrective action and management review – the so-called PDCA-cycle: plan, do, check and act (Deming, 1982). A focus on the processes instead of structures and systems also stresses that all organisations today have to be innovative with focus on continuous improvements of their performance.

An IMS standard based on generic process elements of co-ordination, a general framework for management, has to be extended with specific demands in appendices from the standards for quality, environment, occupational health and safety, social accountability, etc. (Jørgensen and Simonsen, 2002). The similarities or the *generic processes* in a management system are: top management commitment, definition of a policy, planning of objectives and targets, procedures for training of employees, communication procedures, audits, documentation and records control, control of non-compliance, corrective and preventive actions, and management review.

The *advantages* of integration based on the generic processes in different management systems are:

- Focus on interrelations – synergies and trade-offs between quality, environment, occupational health & safety, and social accountability
- Objectives and targets are set up, co-ordinated and balanced
- Organisation and responsibilities are defined in one place.

A *risk* of integration is a ranking of the different areas of responsibility, e.g. that more attention is paid to quality than to environmental issues. On the other hand, the potential is that environment, health and safety and corporate social responsibility can climb higher up on the agenda, if combined with an ISO 9001 quality system; and if the organisation handles the responsibilities in a co-ordinated way. Typically, organisations already have a quality management system and then later integrate environmental procedures, etc. A 'transplanted' environmental management system based on "cut and paste" creates a risk of underestimating environmental issues compared to quality.

G. Zwetsloot (p.121, 1994) expresses the concern that actions on specific problems in each subject area require, but may also obstruct the creation of an integrated system (Zwetsloot, 1994). In order to create positive interactions between the fields of management, a positive vision is required. Also the main approach should be *prevention-at-the source*, as the predominantly negative relations between the aspects occur when an add-on approach is used. Thus, adapting a pro-active approach to problem solving in the different areas provides an opportunity of integration, which can be advantageous in the long run. (Zwetsloot, 1994). This can be interpreted as a call for a more ambitious integration than of system and process aspects only.

Issues such as the organisation's structure, size, market competition and regulatory demands have a decisive influence, when an organisation decides whether to integrate or not, as well as for the level of integration. Further research needs to be carried out to examine these issues more closely.

In a research project by Hines (2002) conducted in South Wales in the UK including 12 small and medium-sized enterprises (SME) and seven large enterprises, it was found that the SMEs were less interested in IMS than the large organisations (Hines, 2000). One reason was a defensive approach towards the intrusion of a new system, which might erode the position of the present manager. The tradition of handling these issues separately can be deeply rooted in the organisation. The senior managers in positions above quality and environmental managers have a better understanding of the overlap and duplication of different management systems and also the strategic considerations of building an IMS that responds more effectively to changes

in external conditions (Hines, 2000). On the other hand, an experience from Danish SME's is that they prefer some kind of integrated management system, since the managers often have combined duties, deal with several areas of responsibility at the same time, and are opponents of too formal systems. (Jørgensen, 2001), (Lorentzen, Remmen, Nielsen and Tybjerg, 1997). This gives SMEs the strength of flexibility, but this here-and-now orientation can be linked to downplaying strategic and long-term perspectives.

Integration
- embeddedness and stakeholder relations

Correspondence between system elements and generic processes of co-ordination are important parts of building up an IMS, but integration can be even more ambitious regarding the internal organisational embeddedness and the external interactions with stakeholders. In order to secure continuous improvements of performance, to bring about competitive advantages as well as to move towards sustainable development, IMS has to be embedded throughout the organisation and in all stakeholder relations.

The preconditions for this level of integration seem to be:

- Shared understanding of internal and external challenges
- A learning organisation and a culture of responsibility
- Interactions with stakeholders.

A shared understanding

A synergy between the different responsibilities of an integrated management system as well as 'real' continuous improvement of the performance is most likely created with high ambitions regarding integration. ISO 9001, ISO 14001 and OHSAS 18001 have requirements for continuous improvements, but the adoption of the standards is not a guarantee for improvements in itself. To secure genuine continuous improvements, the management system has to be embedded internally across the organisation and externally throughout all stakeholder relations.

Wilkinson and Dale (2002) point out that an IMS should have a common system concept with no significant differences in the scope of the IMS. Further, they point at the need for a strong culture, which supports the main elements of Total Quality Management (TQM) like involvement, teamwork, education, training, commitment and leadership (Wilkinson and Dale, 2002). Hines suggests a team-based approach to problems and solutions in IMS and

equal credence to the input of ideas and actions from all employees as to the structures and procedures developed by management (Hines, 2000).

TQM has always emphasised the embeddedness in the organisational culture and the active participation of employees, etc. In other words, integration is rather a matter of culture, learning and employees than common system elements and generic processes. The question is to what degree environmental and social responsibility has become part of doing business? If sustainability has become *institutionalised* throughout operational and strategic decisions based on a shared understanding, cognitive taken-for-granted beliefs, normative values, etc. then IMS has become institutionalised in the organisation and has transcended the traditional focus on system and processes.

> *"In the vision of unification, the term TQM would represent, in formal terms, all the management systems in the organization, given that it is not possible to satisfy the external customer without satisfying the internal customers. Only in this manner will the interests of all the organization's stakeholders (employees, customers, shareholders, suppliers and society) be conveniently satisfied." (Matias and Coelho, 2002).*

If social and environmental responsibility has become institutionalised in an organisation, then it will also be reflected in the interaction with stakeholders, and influence the way in which the organisation engage in stakeholder relations and also how external challenges are interpreted.

The learning organisation

The embeddedness of IMS in an organisation indicates how the different responsibilities are part of the organisational culture and the organisation's capability of adapting to new challenges – 'the learning organisation'.

The learning processes are essential in order to prevent defects in the design or redesign of systems and to secure continuous adaptation to new challenges. To support continuous learning processes, an education policy, supply of information and internal communication is essential. The organisational synergy of the interaction between the general management and the different management systems increases the innovative capability, the problem-solving capability and the ability to learn. (Zwetsloot, 1995). The responsibility for sustainability in the entire product chain together with continuous improvements require continuous rebuilding, updating and innovation within the different areas of the management system.

Without having personally and collectively integrated the related values, the norms, and the understanding of a desired behaviour will not last; the risk is that it will only occur incidentally and hence, it will not be manifested for long. Culture is seen as an enabler for improvements of performance, however culture and learning is a blind spot for ISO standards, so the challenge for organisations is to embed the different responsibilities as an organisational culture (Wilkinson and Dale, 2002).

Organisations with multiple suppliers, customers and stakeholders might need to have separate groups dealing with mainly quality, environment, occupational health and safety, and social accountability as each area needs different types of expertise. However, the groups must work closely together and have an understanding of the issues and impacts related to the other areas of responsibility. Co-operation between the groups and across the departments is necessary in order to reduce trade-offs between the different areas of responsibility, for instance when developing new products. In this sense, cross-functional groups, teamwork, knowledge management, etc. are key elements for embeddedness.

Interaction and co-operation with stakeholders

On a global market with focus on innovation and product differentiation, organisations have to understand new trends and signals from the stakeholders through co-operation, transparency and dialogue. The challenge is to embed the responsiveness in an IMS and in the organisational culture in order to adapt to new demands.

Up till now, the existing management standards for quality, environment, occupational health & safety primarily point at the internal activities of the organisation. However, as pointed out, the revised ISO 9001:2000 standard now pays attention to *customers* and continuous improvements – even though this has not yet been understood by every organisation with a quality management system. At the same time, environmental management systems become more *product-oriented*, and concepts such as life cycle management (LCM) and product-oriented environmental management systems (POEMS) are becoming popular in industry and among stakeholders (Remmen and Münster, 2003), (Hunkeler et al., 2003).

In fact, the discussions on IMS totally lack the perspective of integration with the more product-related standards in the ISO 14000 family such as ISO 14062 on Eco-design, ISO 14063 on Environmental Communication, and the ISO 14040 series on Life Cycle Assessment. A health & safety system mainly focuses within the enterprise, while Corporate Social Responsibility (CSR) and SA 8000 have expanded the social responsibility along the

product chain. In order to contribute to sustainable development, organisations have to expand social and environmental responsibility for their own production to the different actors up- and downstream the product chain (See chapter 16 and Hunkeler, 2003).

For organisations this challenge makes it important to co-operate with the actors in the product chain and other stakeholders in order to improve the conditions of quality, environment, occupational health and safety, and social responsibility in the whole product life cycle. The question is, how far the organisations' responsibility goes, and the answer seems to be that the fields and ranges of responsibility are continuously increasing, reflecting the global product chains and depending on the expectations of stakeholders.

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