Design for Sustainable Development

Environmental Management and Safety and Health

EUROPEAN FOUNDATION
for the Improvement of Living and Working Conditions

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Gerard Zwetsloot is working as a senior researcher and consultant, NIA TNO in Amsterdam (the Netherlands) and is a part-time professor of working conditions and environment at Erasmus University, Rotterdam.

He holds a degree (1975, M Sc) in chemistry (University of Utrecht) and in 1994 was awarded his PhD (Social Sciences) by the University of Leiden for his thesis *Joint Management of Working Conditions, Environment and Quality; in Search of Synergy and Organizational Learning*. This thesis was nominated by the European Foundation for Quality Management (EFQM) for their yearly award in recognition of an outstanding thesis on total quality management. He is frequently involved in research projects for national and international bodies and in strategic consultancy or HSE-benchmarking for leading companies. He has generated a broad variety of publications, and is regularly invited to give lectures at various national and international conferences.

Jaap Bos works as a senior consultant at NIA TNO.

As senior consultant at NIA TNO, Jaap Bos assists companies in implementing management systems for HSE. He is especially interested in performance and integration of management systems. Jaap also carries out studies, e.g. a study on the financial implications of voluntary certification in the Netherlands, and develops instruments for OHS risk inventories. Previously, he was employed at a large environmental consultancy firm as soil sanitation and quality manager.

The researchers who provided the case descriptions for the Annex are:

Lena Weller, Consultant, IQ Consult, Düsseldorf, Germany
Dieter Kropp, Consultant, DGB Bildungswerk e.V. Düsseldorf, Germany
Ilias Banoutsos, Director, Ergonomia, Athens, Greece
Jaap Bos, Senior Consultant, NIA TNO, Amsterdam, the Netherlands
Raj Lakha, Director, Safety Solutions, London, UK
Ann-Beth Antonsson, Manager Chemicals and Work Environment, IVL Swedish Environmental Research Institute, Stockholm, Sweden
Malin Nilsson, Researcher, IVL Swedish Environmental Research Institute, Stockholm, Sweden..

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A report on the EU's Environmental Management and Audit Scheme and its interaction with the management of safety and health

Gerald Zwetsloot

Jaap Bos

EUROPEAN FOUNDATION
for the Improvement of Living and Working Conditions

Wyattville Road, Loughlinstown, Co. Dublin, Ireland. Tel: +353 1 204 3100 Fax: +353 1 282 6456/282 4209 E-mail: postmaster@eurofound.ie

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Foreword

The move towards sustainable development is one of the main challenges for the European Union. It is a key principle of the Fifth Environmental Policy and Action Programme that environmental concerns are taken fully into account from the outset in the development of other policies and programmes. Because of its structure, the European Foundation for the Improvement of Living and Working Conditions can play a unique role in this area by working with industry and being able to operate on the interface of the environment and working conditions.

Against this background, Sustainable Development is one of the six key issues in the Foundation's programme for 1997-2000. The focus of the Foundation's activities on sustainable development is sustainable production and consumption. In order to deal with these issues, the Foundation has launched a project on Design for Sustainable Development with the aim of developing tools, information networks and training for the main actors concerned, such as industry, social partners and designers.

The first publication on Design for Sustainable Development was *Design for Sustainable Development - Concepts and Ideas*. The second publication was *Design for Sustainable Development - Guides and Manuals*. The third publication of a series of publications envisaged provided a *Design for Sustainable Networks Directory*. (The database on which the publication has been prepared is accessible on the Foundation's Homepage on the Internet (www.eurofound.ie.). This new report is entitled *Design for Sustainable Development - Environmental Management and Safety and Health*. Further publications on the topic of practical examples of sustainable product design and renewable resources for sustainable development are in preparation.

Clive Purkiss
Director

Eric Verborgh
Deputy Director

Participants in the Project

Members of the Coordination Group on Sustainable Design and the Evaluation Committee are:

Yorick Benjamin	EDEN, Amsterdam
Torsten Dahlin	Swedish Industrial Design Foundation, Stockholm
Hans van Weenen	Idea, Castricum
Gerard Zwetsloot	NIA TNO, Amsterdam
Jan Kahr Frederiksen	FTF, Copenhagen, representing the Trade Unions' Group of the Foundation's Administrative Board
Margareta Mårtensson	SAF, Stockholm, representing the Employers' Group of the Foundation's Administrative Board
Andreas Tschulik	Ministry of Environment, Youth and Family Affairs, Vienna, representing the Governments' Group of the Foundation's Administrative Board
Robert Nuij	European Commission DG XI, Environment, Nuclear Safety and Civil Protection
Christina Theochari	representing the Committee of Experts of the Foundation
Wout Buitelaar	representing the Committee of Experts of the Foundation

The research managers responsible for the project are:

Henrik Litske	European Foundation for the Improvement of Living and Working Conditions
Jørn Pedersen	European Foundation for the Improvement of Living and Working Conditions

Preface

During the last decade environmental management suddenly became one of the key issues in modern management, sometimes with labels such as 'greening of industry', 'sustainable development', 'responsible care', or 'eco-business'. Health and safety management has a longer tradition, which explains why it sometimes has other characteristics. It also has the advantage that it builds on many years of experience. There are, however, many interrelations, not only in the management approach but also in the very concrete activities that are to be managed. In the development of policies for environmental management, it was easier to use the latest management techniques. They are now being put into practice and have to prove themselves.

In this publication on environmental management and health and safety, we focus on two levels:

- interactions at company level: as companies have to deal both with environmental protection and health and safety, there is now considerable experience of the combination, and the strategies to realize synergies are generally known. An overview is given in Chapter Two, while the case studies in the Annex give the reader an insight into European company practice.
- interactions at policy level: at this level most policy institutions (ministries, European Commission etc.) are separate. Synergy at this level has not yet been realized, except in some Nordic countries. Debates on the use of new policy techniques for health and safety policies are now taking place, including those cases where these techniques have already been fully accepted for environmental protection; examples are the debates on international standardization of OHS management systems and on EU Regulations for voluntary certification of OHS management systems. In the OHS field, valuable experience of worker

participation, and of the management of behavioural change, has accrued. These are also of value in the environmental field.

Chapter Three gives an overview of the relationships at policy level, and the actual European debates.

To illustrate the relevance of the interactions at company level, the Annex includes five case studies of companies in various EU countries.

We would like to thank Ann-Beth Antonsson, Malin Nilsson, Ilias Banoutsos, Raj Lakha, Lena Weller and Dieter Kropp for their inspiring cooperation and for providing the case descriptions from their countries.

Gerard Zwetsloot and **Jaap Bos**

Contents

Chapter 1

Sustainable Development, Environment and Health and Safety

Sustainable Development, Environment and Health and Safety

The Concept of Sustainable Development

The concept of sustainable development came to the forefront with the report *Our Common Future* from the World Commission on Environment and Development (WCED). Sustainable development was defined by WCED as:

> The development that meets the needs of the present without compromising the ability of future generations to meet their own needs[1].

Sustainable development includes aspects of human and economic development, and of safeguarding environmental and natural resources. Health and safety are important elements of human development, but also imply economic impacts and often go together with environmental protection.

Related Concepts and Principles

An overview of concepts and ideas for sustainable development has been given by Van Weenen[2]. We mention here concepts and ideas from that publication that are also relevant to safety and health. We elaborate some specific concepts and ideas that are clearly relevant to health and safety.

Cleaner production implies the search for production processes and products that cause fewer emissions and wastes; generally this goes hand in hand with fewer risks to humans. The (draft) International Declaration on Cleaner Production from the UNEP begins: 'We recognize that cleaner and safer production has economic, health and environmental benefits[3].'

For the production process, cleaner production includes conserving raw materials and energy, eliminating toxic raw materials, and reducing the quantity and toxicity of all emissions and wastes before they leave the process. For products, cleaner production means reducing impacts along the entire life cycle of the product, from raw material extraction to disposal. Cleaner production requires applying know-how, improving technology, and changing attitudes[4]. This marks an important departure from the traditional way of dealing with environmental impacts which, in essence, has been to collect waste by-products, and try to control them by various 'end-of-pipe' treatments – through dilution, detoxification or solidification – or simply by trying to contain them in barrels or landfills.

Implementing cleaner production is not just a question of finding the right or new technology. It includes better management and housekeeping, substitutions for toxic and hazardous materials, process and product modifications, and internal reuse of waste products. It requires basic attitudinal changes at all levels within a firm, from top management to the shop floor[4].

A similar recently developed concept is **inherently safer (and healthier) production and products**[5,6]. The idea is to work towards implementing and realizing processes and products that are inherently safer, require fewer added-on safety or health measures, are simpler to use and are more cost effective over the life cycle. What is often advocated in words should now be implemented in everyday practice! This is different from the traditional way of protecting health and safety which is, in its essence, based on a hazard assessment and on efforts to control or reduce the remaining health and safety risks by various 'end-of-pipe' treatments – through containment, use of additional protective devices, warning systems, personal protective equipment, education and training in careful handling of risky processes.

As with cleaner production, implementing inherently safer production is more than a technological option. Making production inherently safer means a strong emphasis on preventive, process-integrated measures. It implies a decrease in added-on safety (minimization of quantities in stock, reduction of layers of protection, reduction of added-on safety facilities, minimization of procedures in the HSE management system, simpler emergency procedures).

Inherently safer production also implies there are fewer remaining risks due to human failure and a better overall safety performance. Many companies want to reduce structurally the cost of maintenance, lower the frequency of shut-downs without compromising safety, and have more flexible installations. This requires simpler and inherently safer processes. Through inherently safer production the safety performance can be improved while the life-cycle costs of plants and installations are reduced. Inherently safer production saves costs! Inherently safer production is therefore a strategic option for top managers. It is also a technological challenge to engineers. For both it requires a new safety mind-set; this requires individual and organizational learning processes and in many cases a reorientation of corporate safety culture[7].

Green chemistry is a concept that is closely linked to cleaner production and inherently safer and healthier production. Products and processes should be based as much as possible on benign natural renewable raw materials. This contrasts with many existing products and processes that are based on the use of toxic or hazardous materials and processes that originate from limited natural resources. It is often possible to reuse natural materials, and as a rule they can be broken down in a natural way which implies avoiding long term pollution.

Life cycle assessments and chain control imply that decisions about products or processes take into account the (environmental) impact during the life cycle of the product or the production process. A related concept is **product stewardship**. There is a growing interest in life cycle approaches also for health and safety[8], and chain control and product stewardship are increasingly related to product safety and the 'social qualities' of products (e.g. products made without unacceptable child labour).

Internalizing cost in order to prevent shifting of consequences is part of the link with economic development. The current measurement of economic development does not take economic and health and safety aspects into account in an adequate manner. Externalizing consequences is often cheaper than acting responsibly. Very specific to sustainable development is the time dimension: not to shift consequences to future generations. A related issue is the precautionary principle. This principle addresses the way in which uncertainties can be taken into account in decision-making. Uncertainty (or ignorance) should not be the excuse for taking decisions that may cause irreversible damage to the environment or health.

Environmental management systems, and (occupational) health and safety management systems are important tools to help companies manage the impact of their business on the environment and the safety and health of people. Both systems may be part of **total quality management**, a broader management approach that, in principle, strives to excel in all quality aspects (but other forms focus very much on product quality and customer satisfaction and pay little attention to SHE aspects).

Continual improvement, organizational learning and performance indicators. Modern management systems, such as EMAS[9] and ISO 14001[10], but also BS 8800[11] and NPR 5001[12] are designed to manage continual improvement. This requires the introduction of organizational learning processes and performance indicators to monitor and review targets and actual performances. As sustainable development is also a long-term process, the concept of continuous improvement in SHE performances is an important attribute.

The Environment and Health and Safety

There is a mutual relationship between mankind and the environment. On the one hand, there is the influence of mankind on the environment, on the other the significance of the environment to mankind, its relevance for human safety and health, the variety of its economic functions, and its inherent value (for example, the value of a unique eco-system as attributed by man)[13].

The interactions between environmental protection on the one hand and health and safety on the other are increasingly acknowledged. This is illustrated by:

- several activities and publications of WHO[14] and ILO[12, 16]
- the keynote opening speeches (from the King of Sweden, and high-ranking officials from WHO and ILO) at the 25th International Commission on Occupational Health in Stockholm 1996 all referred to the importance of sustainable development for occupational health; the Joint Swedish Safety Council also published a book on this relationship[17]
- Safety, Health and Environment will be the central theme for the XVth World Congress on Occupational Health and Safety, organized by ISSA & ILO in Sao Paolo 1999.

Pollution of the environment, by industry or other workplaces, with a harmful impact on human health and environment, both inside and outside the work premises, may happen as a result of major accidents, low-level continuous pollution of inside and outside air, water or soil, or may be caused by the use of a product or be due to a way of performing an external service. Environmental and health aspects are interlinked in several ways.

A Broader Vision of Health ?

A poor environment often causes problems for mankind, or as Reijnders puts it: 'the environment sometimes hits back'[18]. Humans are involved in ecosystems and do not stand apart from them. That is why we regard humans not only as actors that influence ecosystems but also as belonging to ecosystems. This idea of humans being dependent for their health and safety on environmental conditions may lead to a redefinition of the concept of health.

The present WHO definition of health is: 'Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity'. This definition does not take into account the fact that human health is highly dependent on the state of the environment. Recently an informal think-tank sponsored by WHO and the Rockefeller Foundation developed a broader vision on health. They came to the conclusion that the concept of health should not only refer to the health of persons but also to the health of global life-support systems, to the health of ecosystems and to the sustainability of development and human interactions with the other inhabitants of this planet. To take appropriate account of this broader understanding of the links between environment, development and health, a more holistic definition of health was proposed[14]: 'Health is a state of complete physical, mental, social, ecological and environmental well-being'.

Policies

UNCED, agenda 21

The United Nations Conference on Environment and Development held in Rio de Janeiro recommended the development of environmental management systems[19], which could:

- support the goal of sustainable development
- be compatible with diverse cultural, social and organizational frameworks.

UNCED also clearly stated in Agenda 21 the essential contribution of health protection and health promotion to sustainable development. One of the chapters of the Rio Declaration is called 'Protection and promotion of human health'. The first principle for sustainable development according to UNCED[19] is:

> Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.

Good practice in health and environment management

In Europe there has been a recent initiative from the Ministers for the Environment and for Health to prepare guidelines on good practice in health and environment management for industries and other workplaces[20]. The preparatory activities are coordinated by WHO and should result in a policy paper for the five-yearly Health and Environment Ministers Conference that will take place in London in mid-1999[21].

The responsible care initiative

The Responsible Care Programme, started in 1985 by the chemical industry, is now running in 35 countries, including all EU countries[22]. The European sector organization of the chemical industry describes it as follows[22]:

> Responsible Care is the world-wide chemical industry's voluntary commitment to achieve and demonstrate continual improvement with regard to safety, health and environmental performance. It is driven by eight fundamental features, as agreed by the International Council of Chemical Associations (ICCA):
>
> - guiding principles – formal commitment by a company to a set of guiding principles which have been agreed internationally by the chemical industry
> - codes, guidance notes, checklists – to assist companies to implement the commitment
> - performance indicators – progressive development of indicators against which performance can be measured
> - communication – an ongoing process of communication on safety, health and environmental matters with interested parties
> - informal sharing fora – in which companies can share views and exchange experiences on the implementation of the commitment to Responsible Care
> - title and logo – which clearly identify national programmes as being consistent with and part of the concept of Responsible Care
> - verification – procedures to verify the implementation of Responsible Care by member companies
> - Encouragement of all chemical companies – consideration of how best to involve and motivate all chemical companies.

According to CEFIC, these features make Responsible Care a powerful programme in the move towards sustainable development. It is important to note that Responsible Care is much broader in scope than EMAS and ISO 14001, which do not specifically include safety and health, in order to fulfil the Responsible Care commitment to continual improvement of safety, health and environmental performance, CEFIC recommends that its members implement and/or improve their safety, health and environmental management systems, building on existing company systems and activities. These management systems can be integrated into a single safety, health and environmental management system. When implementing these management systems CEFIC[22] recommends that the environmental management system requirements of EMAS and ISO 14001 be taken into account.

Environmental Management and Health and Safety Management

In the areas of environmental management and health and safety management there are complementary strengths and weaknesses regarding the involvement of important stakeholder groups. Worker participation is an integral aspect of occupational health and safety. As was stated recently in the announcement of an international workshop on OHS management: without worker involvement the management of OHS loses part of its quality, it becomes management of something less than OHS, such as cost or risk minimization. In the area of environmental management an important characteristic is communication with external stakeholders, such as environmental groups, neighbours or other NGOs.

Since we accept that health and safety are important but often underestimated elements of sustainable development, it is clear that worker participation is also essential for sustainable development[23].

The EU's EMAS Regulation and ISO 14001

General

In order to provide companies across Europe with a common framework for evaluating and improving environmental performance, the EU Environmental Management and Audit Scheme (EMAS) was developed. It was published in the Official Journal of the European Communities on 10 July 1993[9] as a 'Regulation on the voluntary participation by companies in the industrial sector in a Community eco-management and audit scheme'. A preparation period of 21 months was given to Member States in order to prepare themselves before EMAS became operational (13 April 1995) and companies could participate in the scheme.

In the development phase, the idea was at first to create a compulsory system of environmental audits and environmental statements for certain types of companies. In the final stage it was decided to introduce an environmental management system for industrial companies, with voluntary participation.

EMAS is an example of the new market-oriented environmental policies pursued by the EU. It complements the existing European environmental legislative framework. EMAS therefore matches the principles of the EU's Fifth Action Programme on the Environment: Towards Sustainability[24]. This programme is based on the principle that industry has its own responsibility to manage and improve the environmental impacts of its activities and that the market will reward this.

The EMAS system is a comprehensive environmental management system involving both external assessment (verification) and provision of the relevant information to the public. The central aims of the EMAS Regulation are as follows:

1. to promote environmental management in industrial companies,
2. to foster the management of continual (environmental) improvement,
3. to promote the implementation of cleaner technologies,
4. to foster external auditing and verification of the environmental management system,
5. to foster communication with the public,
6. to allow companies that meet the EMAS requirements to use the EMAS logo in their relations with the public.

Only individual sites (locations) can be registered under EMAS, so the public environment statements are also based upon individual sites. Companies that meet the requirements can, after third party verification, receive an EMAS certificate and they may use an EMAS logo. It is not allowed, however, to use the registration logo on products or packaging, nor in advertising for products.

The European Commission is promoting pilot studies to increase the participation of small and medium-sized companies in the scheme. The EMAS Regulation allows individual Member States to experiment with ways of adapting the scheme to other sectors, such as the distributive trades and the public service. Currently, only companies in the industrial sector can participate in EMAS. More than 400 companies throughout Europe have already (in 1996) joined the EMAS scheme[25].

In 1998 the EMAS Regulation is being reviewed. The main topics that are being considered during the review are:

- the scope of the application (not only industry but also other branches)
- frequency of validation (each year instead of once every three years)
- emphasizing the relation with ISO 14001
- emphasizing the presence of an operational EMS, before applying for EMAS.

Requirements for Participation and Registration

In order to qualify for registration a company (site) must[26]:

1. formulate an environmental policy that includes compliance with all relevant regulatory requirements and commitment to continual improvement of environmental performance,
2. conduct an environmental review of the site,
3. introduce an environmental programme and an environmental management system,
4. evaluate the system periodically by carrying out environmental audits at the site. These audits may also be carried out by an external party,
5. set objectives and revise the environmental programme accordingly if necessary,
6. prepare an environmental statement specific to the site audited,
7. have the environmental policy, programme, management system, review/audit procedure and environmental statement examined by an accredited environmental verifier.
8. forward the validated environmental statement to the competent body.

When a company has fulfilled these requirements, it can apply to a notified body for EMAS registration. An independent and qualified verifier will perform an audit to establish whether the environmental management system of the company meets the requirements of EMAS. If so, the company will be registered under EMAS. In order to ensure the reliability, independence and quality of the verifiers every EU Member State has established or appointed an independent body for the accreditation of the environmental verifiers.

Relation between EMAS and Other Standards

General

In developing the EMAS environmental management system, extensive use was made of the former British Standard BS 7750. EMAS and BS 7750 can therefore be regarded as identical with respect to the management system and the audits. The only difference is that EMAS requires an Environmental Statement to the public regarding environmental performance. With the adoption by CEN (European Committee for Standardization) of ISO 14001 as the European standard for environmental management systems (1996) and ISO 14010-14011 as the standard for environmental auditing, conformity between those standards and EMAS was no longer assured. Therefore CEN developed a so-called Bridging Document in which guidance is given on the interpretation of various elements of ISO 14001 with respect to EMAS.

In April 1997 the Article 19 Committee of the EMAS Regulation (an advisory committee with members from all EU Member States) agreed with the application of ISO 14001 as a way to register for EMAS. However, it remains the responsibility of the EMAS Environmental Verifier to check whether the requirements of EMAS are met by the company.

EMAS and ISO 14001

ISO 14001 gives a specification for environmental management systems and is open to all business sectors. In order to qualify for certification, a company generally[10]:

1. must have an environmental policy, stating commitment to continual improvement, commitment to prevention of pollution and compliance with all relevant environmental regulatory requirements,
2. must plan activities in order to identify the environmental aspects, set goals and targets and make programs to realize them,
3. must facilitate organizational aspects regarding implementation of the management system and execution of plans. This means, for example, determination of responsibilities, identification of training needs, facilitation of communication, documentation and operational control and also formulation of emergency procedures and response,
4. must have procedures for control and corrective action, including periodic internal audits of the management system,
5. have its environmental management system reviewed by the management. In this management review the highest level of management shall identify whether the environmental policy, the targets and other elements of the environmental management system should be adapted depending on results of audits, changed circumstances and commitment to continual improvement.

The main differences in content between ISO 14001 and EMAS are that the EMAS Regulation comprises stricter requirements concerning the use of best available technologies and a requirement about the Environmental Statement to the public[25].

In order to stimulate continual improvement, the EMAS Regulation introduced EVABAT (economically viable application of best available technology). It was also meant to prevent countries with less stringent environmental legislation complying with EMAS Regulations. In ISO 14001 the concept of EVABAT is less prominent: it requires that an organization shall consider its technological options when establishing and reviewing the environmental objectives. It *may* do so by applying EVABAT.

Probably the most important difference between ISO 14001 and EMAS is that EMAS requires an Environmental Statement to the public. The Environmental Statement gives the public an opportunity to check how the company has been able to meet the targets of its environmental programme. The content of the statement has, however, been left quite open in the EMAS Regulation; it only lists the main issues that must be covered. ISO 14001 only specifies that a company shall consider processes for external communication on its environmental aspects.

Because of the differences between EMAS and ISO 14001, several companies have chosen the strategy of first achieving certification of ISO 14001, followed by an EMAS certificate.

Chapter 2

Interactions between Environmental and Health and Safety Management at Company Level

The Implementation of EMAS/ISO 14001 at Company Level and its Interactions with Health and Safety Management

General

The management of the environment and health and safety are of growing importance for organizations. Management systems can help in implementing structural care for the environment and health and safety. As already indicated in the previous chapter, an internationally accepted norm for environmental management systems, the EMAS regulation, came into effect in 1996[10].

Various countries have also developed standards or guidelines for the management of health and safety (UK, the Netherlands, Norway, Australia, New Zealeand, Spain[11, 12]). A typical example is the introduction in the early 1990s, not by the government, but by the Dutch chemical industry, of the Safety Checklist for Contractors (VCA)[28]. It was introduced by industry to improve the safety performance of their contractors and is now also in use in several other European countries. Because a VCA certificate is a condition for contractors to be permitted to work for the chemical industry, the participation level is high (by January 1998 already more than 1200 companies in the Netherlands, 200 in Germany and 800 in Belgium have received certificates).

It has not yet been decided to develop an international standard for safety and health. The general conclusion of the ISO Workshop on Occupational Health and Safety Management Systems Standardization, An ISO Contribution?[29](organized in close cooperation with ILO), was that it was not (yet ?) a good idea to start global standardization (see also paragraph 3.2). Since then, however, the number of countries that have undertaken similar national activities has increased

sharply. Occupational health and safety management systems, based on the principle of continual improvement and using auditing techniques, are becoming increasingly important.

The question is how companies respond to that development. How can effective and productive management of environment and health and safety be achieved? What motives do companies have to invest in the environment and where does it interact with health and safety? What hurdles have to be overcome to implement these management systems? Such knowledge is scarce, but it is vital to many companies that have to find their way. This knowledge is also important for governmental institutions that stimulate the development of these specific management activities.

The following observations on these questions are mainly based on a project commissioned by the Department of the Ministry of Social Affairs and Employment in the Netherlands. The study was carried out by the Dutch Institute for the Working Environment (NIA, now NIA TNO Ltd) in close cooperation with the Centre for Conservation of Energy and Environmental Technology, CE); the results were published in English in 1994[30]. The objective of the study was to investigate the experiences of industry with the joint management of working conditions, environment and quality. The study is still considered to be up to date.

Stimuli and motives

Environment

Since EMAS and ISO 14001 have come into effect just recently, the discussion is broadened to include environmental management systems in general.

Stimuli and motives that may be relevant to the development of the management of environmental protection are:

- increasing government requirements, actual and anticipated. Experiences with increasing environmental requirements in the form of permits play a large role. Besides these local or regional requirements, the general government policy is important. In the Netherlands the National Environmental Policy Plan Plus and the target group deliberations in that framework as well as some covenants between the government and industrial sectors played a major role for most of the companies
- the market may also be important: the demand for more environmentally benign products
- marking products and production processes as relatively environmentally benign and the resulting gain in reputation.
- increasing cost due to waste processing and soil sanitation as well as increasing environmental tariffs for waste disposal, etc.

The relevance of systematic and structural attention to environmental protection has in many firms only recently been acknowledged. That is why in some firms environmental management has barely been developed. For the managers it is important that a poor environmental

performance will increasingly be a burden on the organization (for example, because of the cost of waste disposal, soil sanitation or perhaps reasons of liability – financial interests). Also, the relative environmental harmlessness is a convincing argument for the sale of products (marketing reasons). Environmental management provides a clear opportunity for the improvement of market positioning. Therefore in modern environmental management systems much attention is paid to effects outside the plant's boundary, for example, use of raw materials, effects of using the product and amount of waste produced when the product is not used any more.

Working conditions

Stimuli or motives for the development of the management of working conditions (for some or all companies) are:

- substantial safety and health risks, inherent in some processes, depending, of course, on the nature of the primary process of the organization
- the attractiveness on the labour market and the optimum use of human resources. This motive plays an important role in activities aimed at job improvement and restructuring of tasks
- the direct involvement of workers and their representatives
- the desire to meet the requirements of national working conditions acts
- to maintain a good relationship with the Labour Inspectorate.

Both managers and workers, or their representatives, regard good working conditions as a company interest. In firms that are front runners in these fields that is in itself not very remarkable. For the managers it is important that the working conditions are at a level that permits the organization to retain or increase its attractiveness in the labour market. It is also in their interest that chances of severe accidents or substantial health risks are minimized. Managers are currently aware of the substantial contribution of good working conditions to the reduction of sickness absence and consequently of not having disabled workers on social security. Sometimes safety (broadly defined) is so important that it has priority above productivity. More recently[31] the economic incentive is becoming more and more important, since in some countries public costs of sickness absence are transferred to individual companies. Also, liability aspects are increasingly important (for example, asbestos-related diseases). This is in line with the environmental policy that the polluter pays.

For workers, interest in good working conditions is immediate, since workers are the population at risk. Indirectly, workers have an interest in aspects such as the reduction of sickness absence and not being on social security, and collectively an interest in the relationship with the labour market.

Interactions between the Management of Environment and Health and Safety

Current approaches to working conditions and environment concern internal and external affairs respectively. This difference is fruitful as long as it concerns the differences in terms of effect:

environmental effects are usually found outside the firm, while effects on working conditions are usually found internally. As prevention or measures at the source are important to environmental management and since many sources are usually found at or near the workplace, environmental management has to be effected at the workplace. This implies an overlap with the management of working conditions. The most important overlap concerns the prevention and control of occurrences and emissions of substances or noise or vibration (chemical and physical factors) at or near the workplace. The importance of these overlappings in a specific firm depends largely on the primary process, especially on the role of chemical substances and physical factors in that process.

The above point raises the question of how the domains (responsibilities) between the two management aspects are defined. Do they overlap? Is there clear demarcation? Or does it give rise to confusion?

The following views were found to be relevant:

- Management of working conditions and environment are regarded as complementary. This approach can lead to the clear demarcation of the domains. The advantage of such demarcation is clear: it precludes duplication of effort and prevents confusion over responsibilities.
- Working conditions and environment can be regarded as similar risk areas that have to be controlled. In this 'risk management approach' the aims of the two areas are defined as the prevention, anticipation and solution of risk problems. This approach can lead to the integration or partial integration of the management systems, and also to the active use of experiences in similar situations.
- Working conditions (at least those concerned with safety and health) and environment can be regarded as a unity. The common aspects of safety, health (working conditions) and environment are so important that they actually form one area. This is a fruitful view if the prevention or control of the emission of hazardous substances (or physical or biological factors) is a central item for both problem areas. This approach leads to a systematic attempt to integrate and/or use analogies between the management of working conditions and environment.
- Both systems are supportive of the primary process and at the same time control relevant parts of the primary and secondary processes. The management system for working conditions and environment identifies critical control points (support) in order to control and improve the process (control). Management of environment and working conditions as part of the primary process fits into the concept of total quality management (TQM): all relevant aspects (working conditions, environment, quality, personnel, etc.) are managed integrally.

Implementation Strategies

Both environmental management systems and management systems for working conditions are, generally speaking, based on the concept of plan, do, check and act ('Deming circle'). This concept is an important and widely used strategy for implementing management systems. However, when implementing management systems for environment and health and safety, some important choices still have to be made and problems have to be overcome. The most important ones are discussed below.

Top down or bottom up

Generally front-runner firms choose a complex implementation strategy, combining top-down approaches with bottom-up initiatives. These are regarded as more successful. But even when such complex strategies are dominant, it can be tempting to implement a new procedure with some extra support from the top (i.e. top-down), because it seems easier and quicker that way. However, this practice proved attractive only in the short run. The acceptance problems that are neglected in this way increasingly generate resistance to the successively proposed improvements, and so cause substantial delays in the next part of the trajectory.

Design versus acceptance

A good design of the management system may result in good starting points, beautiful procedures on paper but a continuously increasing resistance within the organization. Eventually the resistance may be so strong that a fundamentally different strategy is needed, which concentrates on gaining acceptance within the organization and puts emphasis on the acceptance of the proposed measures. This means the conscious choice of a difficult and long lasting process that has consequences for the total organization.

Organizational learning as a key to success?

Some firms are conscious of their organizational learning process. Consequently, they are managing this learning process; the concepts of organizational learning and the learning organization are being used to improve this management. Because most firms also follow a process approach and implicitly a 'learning approach' (mostly on a 'trial and error' basis), it can therefore be said that organizational learning processes are actually essential for implementation processes and their management, and also for the further development of already functioning management systems. This might therefore be the key to answering the central question about the optimum joint management of working conditions and environment.

EMS and OHS Management Systems, Potentials for Synergy

Synergy or Competition: Some General Aspects

For most firms the common aspects of working conditions and environmental protection are important. These are mainly determined by the nature of the primary production process and the most important product/market combinations. They offer opportunities for common aspect synergy. Contradictions can arise when a common aspect is not regarded as such or common

solutions are not at hand. These kinds of situations easily lead to suboptimization and are a handicap in the creation and use of opportunities for synergy. They also depend strongly on the relative importance that is attributed to the two areas – they have to be more or less equally important.

An important common characteristic of the two management systems is their desire for structural control and the improvement of technical, work and management processes. This seems to be the basis for the creation of opportunities for management system synergy. Competition may arise through factors such as differences in external requirements, involvement of top management, participation of workers, staff experts, educational programs and emphasis on correction versus prevention.

The interaction between the management systems and the general organization is two-way: general management influences the management systems and their development, and the management systems have an impact on the development of the organization as a whole. The potential synergy between the management systems and general management is based on the mutual reinforcement of the primary function of the firm on the one hand, and the functioning of the management systems on the other. This kind of synergy is called organizational synergy.

Potential for Common Aspect Synergy

Items that are directly relevant to more than one management area can be regarded as common aspects. Because common aspects always have implications for more than one area, they can be regarded as sources of interaction. When regarded in this way, they offer opportunities for synergy and may also generate competition between environment and occupational health and safety.

Some examples of overlappings due to common aspects between health and safety and environmental protection are:

- control and minimization of material throughputs, including the control of accompanying information processes
- substitution of hazardous (toxic) components in production processes and products
- prevention and control of emissions and spills
- noise or vibration problems
- dealing with biological agents/hazards
- radiation (ionizing and non-ionizing)
- attitude towards prevention at source
- good housekeeping
- adequate collection of chemical waste
- registration of accidents, incidents and spills
- analogous regulation requirements in the fields of working conditions and environment (e.g. with respect to the stocking or use of hazardous substances or with respect to the prevention of major hazards)

- management of the safety, health and environmental performances of contractors
- process safety with potential internal and external consequences.

Common aspects not only have consequences for the demarcation of management systems, they also raise questions about who defines problems and who evaluates their potential solutions, about responsibilities and procedures. More generally, they pose dilemmas for cooperation or integration.

If the consequences of common aspects (problems or opportunities) are perceived as relevant to only one aspect, the consequences in the other area could easily be overlooked. This implies potential contradictions and a tendency towards suboptimization. The creation of common aspect synergy requires that the consequences are fully understood in all their impacts.

Although problems can sometimes be predicted, they also arise accidentally. This raises the question of how adequate problem definitions that take all relevant aspects into account can be obtained. What is required to evaluate all relevant aspects of the solutions? If one aspect is dominant in the process of problem definition or in the determination of solutions, this will imply a tendency towards suboptimization, because it could easily be a source of potential contradictions. Contradictions may make the search for opportunities for synergy seem like wishful thinking.

For the creation of synergy, the challenge, however, is not to accept partial solutions but to develop a more fundamental common solution. For the people involved this requires alertness to multiple aspects and adequate knowledge. It may also be important to involve the respective experts by means of standardized procedures. It will generally be desirable to ensure that the problems are approached from a variety of points of view, interests and disciplines.

The common aspects usually imply that measures at source are beneficial both for environmental protection and for health and safety. Contrastingly, corrective (end-of-pipe) measures tend to solve problems for one aspect only. As the benefits of prevention at source can often be found in more than one area they are usually much more attractive from the perspective of sustainable development.

Overlapping domains may lead to ill-defined responsibilities or procedures. This is, of course, a hurdle for common aspect synergy. When common aspects are important in the organization, the best strategy seems therefore to be the integration or fine tuning of responsibilities (in the line organization), structural cooperation between staff experts, and the integration or mutual referring of procedures and prescriptions. The most important overlap concerns the prevention and control of occurrence and emissions of substances or noise, vibration or radiation and biological hazards (chemical, physical and biological factors) at or near the workplace. The importance of these overlappings in a specific firm depends largely on the primary process, but especially on the role

of chemical substances and physical and biological factors in that process. An overview of the options raised by common aspects is given in the table below.

Table 1. *Overview of options raised by common aspects* [30]

Tendency towards suboptimization	Tendency towards synergy
One aspect is more important than another (partial dominance)	The two aspects are more or less equally important
Ill-defined responsibilities	Responsibilities fine-tuned or integrated
People having only a limited interest and knowledge; problems and opportunities not fully understood in all their aspects	People being involved, alert and well-qualified in both areas; problems and opportunities fully understood
No structural procedures for the involvement of the respective experts	Involvement of the respective experts is ensured by standardized procedures
Emphasis on corrective action (end-of-pipe measures)	Emphasis on prevention at source

The importance of recognizing common aspects of the interaction of environmental management with health and safety management is clear. Sustainable development could be promoted by the further development of unifying concepts.

Potential for Management System Synergy

Management involvement

The involvement of top managers with the management of working conditions and environment is very important for creating synergy. Management involvement in itself is not a good indicator of the effectiveness and productivity of the management activities. A possible explanation is that the managers direct their efforts precisely to those areas that are supposed to need improvement. Management involvement is a good indicator of the efforts being made towards improvement.

The management of working conditions is not yet so frequently defined as a 'system' as is the management of environmental aspects. It is likely that the use of a systems approach is related to the involvement of top managers. The use of a 'system–definition' is clearly a management tool.

The active involvement of middle managers is very important in each management system. However, on top of their other tasks, it is an additional burden for them, though it can also be perceived as a challenge. The impression is that the involvement of middle managers can be regarded as the key to success in each firm, but that it is usually not yet optimized. The involvement of middle managers is generally minor in the relatively new field of environmental management.

Participation

Participation in most companies is important and complex. Workers are involved with management systems in five ways: through their responsibilities within their jobs and tasks, through direct influence in permanent or temporary groups, such as semi-autonomous task groups or quality control circles, through normal regular discussion or more specific forms of deliberation, through the workers' representatives in the works council or the SHW– committees, and through the influence of the unions. The direct involvement of employees in the functioning of management systems is most clearly shown by the regulation tasks that are either additional to or part of their normal jobs.

Using similar or integrated instruments

At most firms a great variety of management instruments consciously apply lessons learned in a similar area, or learning by integrating instruments.

Through the variety of instruments and the mutual use of lessons learned, win/win situations between environmental and OHS management systems are created. This can be called **management system synergy**[30]. In practice the opportunities for management system synergy are used whenever that seems beneficial, and preferably in such a way that no additional problems are generated. Most companies approach this pragmatically.

The influence of experts

In most large firms experts are available for both occupational health and safety and environment. Their network relations are rather different. Environmental experts generally have more say in strategic decisions than safety experts. The influence of both types of specialists on working conditions is strongly focused on production and is very limited with respect to the strategic policy, and to research and development. Safety experts have a markedly varying influence on innovation and strategy. The influence of occupational health on innovation and strategy is rather poor.

The influence of the experts described above corresponds rather well to their status according to their business cards. Environmental coordinators quite often present themselves as managers, as do a few safety experts. Occupational physicians never characterize themselves as managers; they always emphasize their expertise. The above mentioned differences can impede the development of cooperation between the various specialists and the creation and use of opportunities for synergy, but they also clarify the potential benefits of cooperation: the experts could mutually use each others' networks and increase the efficacy of their efforts.

Table 2. *Management instruments used for the creation of synergy between the two areas*[30]

Policy instruments
Statement of intention
Policy statements
Annual program
Annual report
Management steering committees
Audits
Handbooks (procedures)
Deliberation structure
Human directed prevention and control instruments
Qualification of employees
Education and training
Job descriptions (specific parts of)
Evaluation methodology for the functioning of managers and employees with respect to the specific management initiatives
Assurance methodologies
Information directed
Administration and documentation and supportive software
Monitoring (measurement)
Material safety data sheets
Recognition of lots, product labelling
Notification procedures for undesirable situations or opportunities for improvement
Handbook with prescriptions (local and operational)
Directed at the increase of self regulating capability
Regulation tasks as part of most jobs
Regulation tasks delegated to task groups
Deliberation (local level)
Cross-functional regulation circles
Shift improvement projects
Delegation of responsibilities and power
Directed at increasing the efficiency of the organization
Cost-benefit considerations
Work place directed
Workplace inspections
Specified requests from workplace for environmental licences
Directed towards unforeseen circumstances
Emergency planning (organizational and technical)
Repression devices

The influence of the stages of MS development

Management systems in most firms are not always developed to the same degree. A distinction can be made between three possible stages:

- the starting stage when the system and its introduction are being designed
- the implementation stage when the system is being introduced
- the operational stage when the system functions and is further developed.

The differences in stages can cause different interactions. When these differences are substantial or moderate, most opportunities for synergy spring from using the lessons learned from the more developed area and applying them to the development of the least mature system. When, for example, environmental management is the least developed, this means that in the development of environmental management benefits can arise from using lessons learned in the areas of health and safety. There is however also 'the law of the restraining advantage'. Just because in this case there has until now been a short history of environmental management (as an item of systematic management) it is likely that it will be introduced according to the latest state of the art. That can generate stimuli for innovation in the management of working conditions. Several examples thereof are given throughout this publication.

The differences between stages can also have consequences for the way in which opportunities for synergy are realized. In cases of substantial differences a separate analogous development is more advantageous. When stages are substantially different most of the firms do not choose the integration strategy. A different development is then regarded as more beneficial because it is anticipated that the development will be realized more effectively and efficiently that way. It also increases identification and stimulates the extra attention that is needed for a rapid development.

A minor or negligible difference between stages makes another strategy for the realization of synergy attractive: integration. This is based on the principle of 'killing two birds with one stone'. It can also be regarded as a way to make cooperation, and thus the exchange of lessons learned between various stakeholders and disciplines, structural. It is important to realize that integration increases complexity. That can easily cause delays in decision-making. Integration is only attractive therefore when it offers other advantages. When there are many common aspects in the firm, implying substantial overlapping of the management systems, integration becomes very attractive.

Competition and contradictions

The management of working conditions and environment can compete for common resources of finances, tools (for specific activities), time (attention) of everyone involved (especially managers, supervisors and staff experts with tasks in two or three areas), and additional use of manpower. Competition for common resources can be strongly stimulated by external requirements. This can easily lead to a 'first come, first served' situation.

It is important to note that external, contradictory requirements can be resolved only by the action of the firm itself, usually by the personal involvement of top managers, who have the strongest interest in optimization of the whole. Competition between the two management systems is also likely when one of the areas is regarded as much more important than the others. That can be the case if activities in one area are usually perceived as much more beneficial (in terms of financial benefit), if the marketing interests differ widely (for example, due to certification) or if there are important conflicts with authorities (for example, over environmental licences). In all these cases the area that is regarded as the most important tends to dominate the others and can easily impede their further development.

Another contradiction may arise: that of the contrast between having the emphasis on dealing with technical items (hardware) in environmental management, and dealing mainly with work processes and workers (humanware) in working conditions. Some people may regard these contradictions as proofs of fundamental differences between the two management areas. Emphasizing the contradictions easily leads to the optimization of each individual management system and so to suboptimization of the whole.

Implementation of synergy

In general, aiming at synergy is regarded as interesting and important for most firms. That does not mean that most firms are already operating systematically towards the realization of opportunities for synergy. It seems that there is a substantial difference between the general awareness that synergy can be possible and useful, and the actual implementation. An interesting question is why so many opportunities for synergy are not being used. A prominent factor is the 'distinction between systems'. The problems in each management system are often regarded as unique by the people who are most involved with it. Increased communication is likely to reduce this effect. A second factor is that a problem is often only dealt with when it has become tangible and concrete. If an environmental problem turns up, people start to solve it. This is often done without first systematically verifying whether similar problems have occurred and have already been solved by other people in the organization. Increased anticipation of potential problems would increase enormously the capability of using the lessons learned.

A positive motive for managers is that they can easily link similar phenomena and they wish to have an overview. A negative factor for them is the burden they carry as the result of separated audits and controlling activities. Each of these audits encompasses a number of common elements, for example, the requirement to demonstrate that the style of leadership is stimulating, and that the managers have a long-term vision. This is seen as an avoidable burden that could be eliminated by a joint approach.

Interactions between the two management systems and the organization

The interaction between management systems and the general organization is two-way: general management influences the management systems and their development, and the management systems have an impact on the development of the organization as a whole. The potential synergy between the management systems and general management is based on the mutual reinforcement of the primary function of the firm on the one hand, and the functioning of the management systems on the other. Items relevant to organizational synergy are objectives, structure, technology, strategy, culture and people. This kind of synergy is called organizational synergy.

Organizational objectives

The general objective of the continuity of the organization can be achieved with the realization of the important objectives in each of the management systems. When these objectives are integrated into the general objective, this greatly encourages their realization. A second important item is the

return on investments that is generated by the management systems. If this is positive then further development is encouraged.

Strategy

A general orientation towards long-term objectives and strategies turns out to be beneficial to the development of each of the management systems. From another point of view, each of the two areas requires a long-term approach, and this can stimulate the development of a more general long-term view. They require also that management attention goes upstream to the source of the problem, paying attention also to procurement and general research and development.

Structure

A flexible structure and an increased capacity for self-management are important factors for the rapid (effective and efficient) development of the management systems. The development of these systems are themselves stimuli for the organization to become more flexible, etc. The creation of semi-autonomous units and integral jobs seem to be the keys.

Technology

The development and use of integrated technology stimulates each of the management systems and the organization's capacity to create and use synergy. Integration with research and development activities, which simultaneously contributes to increased effectiveness and the productivity of R & D, is important.

Culture

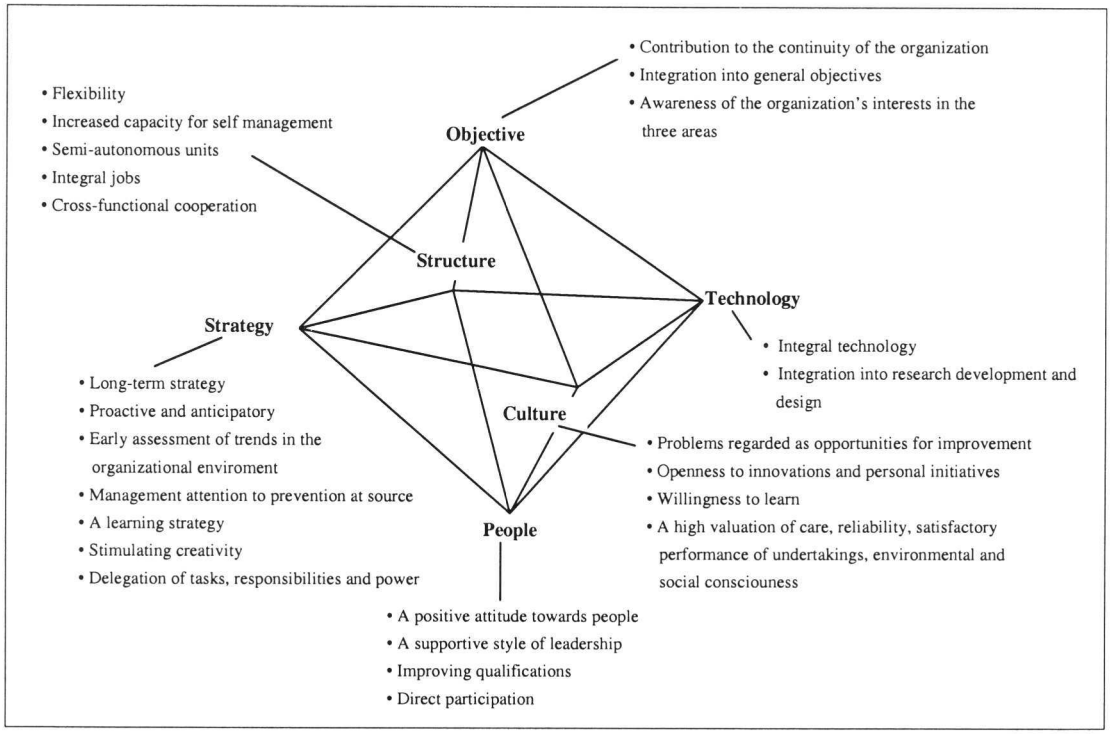
The existing culture is considered by many companies to be the main barrier to the rapid implementation and effective functioning of the two management systems. Each of the two areas can however also contribute to the desired changes in the corporate culture, for example, a higher evaluation of care, reliability, satisfactory performance of undertakings, environmental consciousness, taking account of impacts on colleagues, attention to the long-term impacts of personal action, awareness of the undesired consequences of desired activities, openness to innovation, development of initiatives, and the creation of a willingness to learn.

People

Another interaction is that of people and the policy towards personnel and organization and the two management systems. A positive attitude towards people, suggesting a supportive style of leadership, is very important to the two areas. Increasing the qualifications of the personnel, and the systematic development and use of the creativity on the shop floor – implying direct participation – are essential to the functioning of the two management systems, and have a positive influence on the total organization. Integrated jobs, and the consequent delegation of tasks, responsibilities and power seem to be a precondition to that.

An overview of the items relevant to organizational synergy is given in the figure below.

Figure 1. *Overview of items relevant to organizational synergy*



An Overview of the Case Studies in the Annex

Five case studies from front-runner companies in various EU countries are described in the Annex. These case studies follow a format that introduces the organization (1), and then highlights the following elements: aims and strategy (2), implementation (3), monitoring and control (4), evaluation and organizational learning (5), communication and cooperation (6) and notable findings (7). This format can be used to analyse the dynamics of the process of continuous environmental and safety and health improvement and the roles of the various key actors therein.

1. The Organizations

It was the intention to describe the experiences in five medium-sized front runner companies in various EU-countries. It is remarkable that, with the exception of Allers Bedrijfswagens, four of these five front-runner companies are actually sites of multinational companies. The multinational companies give the sites a strong incentive to implement the EHS management system(s) and provide support and tools, which explains their advantage. For this reason, these case studies represent not only the experiences of these sites but also reflect the experiences of multinationals as a whole. The dominance of multinational companies indirectly shows the importance of networking among companies (the multinationals all have their own network for exchanging information and experiences). Small and medium-sized companies do not usually participate in such effective networks.

The Allers case study (160 people spread over six sites), however, shows very clearly that it is possible and can be profitable for medium-sized companies as well to develop EHS management systems and to implement them even in small sites.

2. Aims and Strategy

Important drivers for the implementation of EHS management systems are external pressures (for example, from public opinion, actions of environmental groups) and internal pressures (for example, to develop good examples in the company, as part of total quality management or stemming from initiatives from workers). The awareness of the need to become a 'sustainable company' plays a role in only one case (Elais), but the purpose of increasing eco-efficiency is more broadly accepted. Once undertaken, the financial profitability of EHS excellence is a very notable driver for continuing progress in all five case studies; the BRM case shows that EHS management may even be regarded as essential for survival.

Where environmental management is corcerned all cases have chosen to strive for periodic external verification of their management system, and the associated certification from EMAS or ISO 14001. This is not the case for health and safety management, since generally accepted requirements for certification are not yet available.

One reason to opt for ISO 14001 is that it is a globally recognized certificate that is more readily appreciated by stakeholders outside Europe. EMAS is, however, cherished by some companies because it comprises more externally oriented requirements, especially regarding external communication; this is important for those companies that regard the general public (often the end-consumers of their products) as an important stakeholder group. Taken seriously this requires more than just an additional annual report for the public at large: the criteria that are appreciated by the general public are likely to be different from the criteria of the verifiers!

All companies define both qualitative aims (often guiding principles) and quantitative targets. Quantitative targets are relatively easily set and monitored for technical performances (for example, emission reductions, elimination of undesirable substances in products); clear-target setting and periodic updating of targets is very important for continual improvement. The behavioural, awareness and value-related purposes are by no means less important (all companies value their EHS or TQM culture, and they are often regarded as preconditions for the more technical performances), but are not so easy to define, quantify, measure and communicate.

3. Implementation

Visible management commitment, including exemplary and proactive behaviour of top managers, is a very important success factor in EHS management. The willingness of top managers to promote EHS management goes hand in hand with the awareness of the strategic importance for the survival, profitability, image of the company. Management commitment is essential for the integration of EHS management in the company's business processes and line responsibilities.

Worker participation has a long tradition in occupational health and safety, but also proves very useful for environmental management. The involvement of the works council and/or of a SHE committee can be crucial as is demonstrated most clearly in the Springer case, where two members of the works council are actually co-managers for environmental activities. Each of the companies invests in the competencies of all employees and all departments to contribute to EHS management. The fruitful cooperation of the respective specialists in the various fields, and the willingness to learn from the mutual experiences and know-how, are other prominent success factors.

In environmental management the focus is initially on technical measures and the associated concrete results. Organisational, behavioural and communication aspects become gradually more important, as they are essential for the ability to continue to improve. In this area much more experience is available from the area of health and safety management. In a service-dominated company like Allers the human aspect of EHS management is more important than the technical aspects. As the general tendency of companies is to become more service-oriented these human aspects of EMS will probably become crucial in the coming decades. From the perspective of sustainable production these human aspects will probably become essential, because the search for dematerialization at company level goes hand in hand with the tendency towards more service-driven organizations.

Common aspects of environmental protection and health and safety, such as those stemming from the use of organic solvents (Springer) or from toxic substances (BRM), again prove to be a very important reason for companies to align or integrate environmental management with health and safety management. This is also the case where the same business activities (for example, maintenance and repair in the Allers case) determine actual environmental and health and safety performance.

4. Monitoring and Control

Monitoring and control (i.e. taking corrective action when needed) are essential elements of any management system. That presupposes that the company organizes adequate management information. This information functions best when closely linked with the aims and targets defined, and gives regular feedback on progress made or difficulties encountered. Performance indicators are more easily defined for technical performances than for the human aspects, which makes them easier to manage, although not necessarily more important. The case studies show that management information can be supported by databases, intranet facilities or other kinds of computer support.

Regular internal audits are an essential contribution to the generation of adequate management information. The internal audits are complemented by external verification for two reasons in particular: to build in a guarantee that practices and local experience within the company are periodically scrutinized by external experts (to verify that no essential items are overlooked) and to raise the company's credibility for external stakeholders (via the certificate).

5. Evaluation and Organizational Learning

Since most EHS management systems have been implemented only recently, the resulting impact of these systems on EHS performance is only now emerging. The case studies suggest that very promising results can be obtained in various areas such as emission reductions, improved product design, employee motivation and attractiveness on the labour market.

Periodic management reviews are a key opportunity for showing management commitment, but also for defining the strategic impact of EHS management. EHS issues become part of the regular company SWOT (strengths and weaknesses, opportunities and threats) analysis, and the impact of EHS performance on market position becomes clearer. The assessment may comprise aspects such as the inclusion of environmental and social aspects in product stewardship (Springer), a growing ability to innovate and to steer research and development (ABB), safeguarding or increasing attractiveness on the labour market (Allers, ABB), increasing eco-efficiency and increasing profitability (BRM, Springer, Elais). Regular (internal and external) audits are an essential input for these management reviews.

All the case studies show that investing in the competence of people, both individually and collectively, is crucial in EHS management; training and HSE qualification are key activities. In the service organization Allers, the human factor is actually the central issue in EHS management systems. Employee initiatives contribute greatly to organizational learning and the 'safety man of the week' is explicitly given the opportunity to develop initiatives.

The collective learning processes may be supported by information systems that ensure that relevant information (in the form of limited documentation or databases) is available whenever needed.

6. Communication and Cooperation

Communication and new forms of cooperation with external or internal stakeholders are characteristics of all the case studies. The external stakeholders may include the end-consumers (reputation in the market), the local press, the community, the governmental enforcement agencies (and the requirements of environmental permits), and also the general public. A notable example is the communication with their consumers developed by Elais in cooperation with the World Wildlife Fund. Certification may improve the external credibility of the company's information, and in this respect EMAS is preferred over ISO 14001.

Networks within a multinational or with companies at the same location can help a lot; companies can learn from each other, but also need each other, for instance for product stewardship. Support from corporate staff may help substantially (ABB, Elais). This raises the question of whether sector organizations should provide similar support to SMEs.

Internally the participation of all people is important. The works council or an EHS committee may have a catalysing, or even a responsible, role (members of the works council acting as co-managers for EHS in the Springer case). It is worth noting that health and safety professionals regularly play a key role in the implementation of environmental management systems (ABB, Elais, Springer). New or more intensive forms of cross-functional and cross-departmental cooperation are also vital.

Finally, there is a common culture aspect in all cases: the culture guarantees that there is always an agenda for EHS issues in these companies.

7. Notable Findings

The case studies show the need for diversity in cultures that is important in the development of management systems, and is indeed inherent to sustainable development. The cases clearly show there is not one best solution for all companies, but rather a broad variety of interesting options. Besides variety, there are many similarities too, based on a similar underlying management system philosophy. In many cases the systems for environmental management, or health and safety management, may be integrated or set up separately. It may be part of an explicit total quality management strategy, or not.

It is worth noting that for these five companies EHS management has gained a strategic meaning for the company. This seems to be a guarantee for continuity and further progress. The added value stems from improvement of crucial business processes. The benefits may be found in increased profitability, the generation of new business opportunities, greater attractiveness on the labour market, and, of course, in cleaner, healthier and safer production processes and products. New forms of external communication and cooperation are emerging as a consequence of stakeholder management.

From the perspective of sustainable development, EHS management systems contribute to the willingness and ability of companies to improve their environmental and social performance. In sustainable development dematerialization and growing service aspects will take place; as a consequence human factors will probably become gradually more important at company level, while technological factors remain of constant importance. These crucial human factors include leadership and commitment by top managers, participation by workers or their representatives, structural management of EHS areas of competence for all employees, and various forms of organizational learning.

Conclusions at Company Level, within the Perspective of Sustainable Development

General

Management of sustainable development implies integral management of all relevant aspects in order to meet the needs of the present, without hindering the development of future generations

(see section 1.1). In this context, the management of sustainable development at company level is much broader than the management of environment and occupational health and safety. Although the latter focus on continual improvement, their scope is mostly limited to effects on the company itself and its close surroundings. The overall global effects are not incorporated structurally and the criterion – not hindering the development of future generations – is not translated into concrete actions. The Responsible Care Programme started by the chemical industry comes close to the general scope of sustainable development. TQM approaches, such as the EFQM model, imply integral management of all relevant aspects (and effects) of an organization and therefore implicitly support the management of sustainable development. Whether it is realized in practice depends on the corporate values and the mission of the company.

Management of Sustainable Development

As stated above, management of sustainable development implies integral management of all relevant aspects. This means that all measures and activities of the company, in terms of environment and occupational health and safety, have to be measured against the criterion of not hindering the development of future generations, i.e. an integral approach. This requires a global insight into the negative effects of actions undertaken and a global policy to minimize those effects. This is not yet the case. At national level the policies of the different parties (governments, unions, companies) are not yet aimed at sustainable development. Consequently, regulations imposed upon companies concerning occupational health and safety and environment are not focused on sustainable development.

In addition, important stakeholders such as clients and the general public are not focused on sustainable development, but more on comprehensible sub-themes such as pollution, dumping of waste and child labour, thus enabling only partial HSE improvements.

As a result, it may be difficult for companies to identify their own policies on sustainable development. However, a management system approach to environment and occupational health and safety offers companies several opportunities to improve their performance regarding these areas and might contribute to sustainable development. For example, an EMS might give companies a better capacity to adopt eco-design approaches and related innovations. When adopted, an EMS may even 'formalize' sustainable development within the organization by stating commitment to it in the environmental policy. This is no guarantee of success, however.

On the other hand, a management system approach also has limitations and weaknesses. Due to its strong focus on the subject of HSE itself, no inherent attention may be paid to aspects such as product stewardship, redesign of products and marketing opportunities, for example, aspects which are important for the realization of sustainable development and the continuity of a company. Furthermore, the impact of a management system approach performance might be weak or unclear. It might be more a management tool than a tool for HSE progress, it is very complex

for small enterprises, emphasis may be on procedures instead of on improvement and it may take a long time to implement. It is important to realize that these weaknesses and limitations exist and that an effort is made to deal with them. Examples of the latter are the development of a simple HSE model management approach for SMEs[32, 33].

Integration of Management Areas

Integration of all relevant management areas within the company and the use of synergy between them is a must for the management of sustainable development, because of its broader and more comprehensive scope. As we have seen before, this is not accomplished easily by companies. The joint management of environment and occupational health and safety, however, may form a good starting point for the management of sustainable development. Structural and effective sustainable development can only take place when the policies at company level are aligned with regional and national policies aimed at sustainable development.

Chapter 3 Interactions at Policy Level

Regulation and Self-regulation of Management Systems

Traditional regulatory approaches for environmental protection and for health and safety have been based on a direct 'command and control' type of legislation. This type of legislation has, however, led to only limited success. Policy makers are now confronted with limitations in the ability to model society. Other actors, like companies, trade associations and unions, develop their own policies. They take the regulations into consideration, but no longer automatically as the dominant motive in their decision-making. This implies that in present society, the government is not automatically the dominant actor, but is more likely to be just one of the prime actors. It is not only the government that takes initiatives – other stakeholder groups generate initiatives as well, which may be in line with or in conflict with governmental policies. As a consequence the self-regulation concept has become increasingly popular.

Self-regulation implies that the enterprises practice 'self-reflection', in this case on environmental protection and on health and safety matters. This should lead to integration of these aspects into the strategic and operational decision-making within companies[33]. Environmental and health and safety management systems are the key tools for companies to integrate these aspects into their decision-making. In this way governmental policies to promote these management systems have arisen, in mandatory form in Norway and Sweden (Internal Control legislation*)[35], and in the EU as a whole in the voluntary form of the Environmental Management and Audit Scheme Regulation.

* The Norwegian Internal Control Regulation includes both environmental management and health and safety, whereas the Swedish Internal Control Regulation addresses the working environment only.

However, although moving beyond command and control may be feasible and desirable, at least to a certain extent, it implies new regulatory dilemmas and pitfalls[36, 37].

As a consequence of self-regulation, environmental, health and safety policies are increasingly being negotiated with the other key actors (such as industry or specific trade associations), to get their explicit commitment to improvement of their EHS performances (two examples from the Netherlands are the reduction programme on carbohydrate solvents that started in the mid-1980's, and several covenants with sector trade associations on their contributions to national targets for emission reductions or conservation of energy). It implies also that governmental agencies have to adapt their policies to specific target groups.

Self-regulation implies that the government adopts a mixture of policy tools. Mandatory legislation can be complemented by economic incentives, by voluntary regulation and by promotional activities. It implies a reconsideration of traditional ways of enforcement.

It is increasingly recognized that national policies to support environmental or health and safety management should focus partly on activities and incentives to promote and implement proactive, preventive good practices. This includes a basic legislative framework complemented by voluntary regulation, economic incentives, negotiating the commitment of stakeholder groups, and the stimulation of new business opportunities. A relevant example is the modern environmental permits that require the adoption of EMAS (and similar OHS schemes); these provide particularly strong incentives for the implementation of environmental management systems in enterprises and they are now used in some countries, for example, the Netherlands, as a vital environmental policy tool. On the other hand, the policy mix should focus on activities and incentives to ensure that poor practices in environment, health and safety management are not rewarded,but are actually reduced or eliminated. This requires specific enforcement strategies, the effectuation of economic disadvantages associated with poor performances, loss of public image, etc.[20]

Finally governments are just like companies in defining their core activities and may wish to reach their objectives directly but also indirectly via privatized bodies, via influencing other key actors and via incentives generated by public image. Particularly with respect to environmental policy, it is now increasingly recognized that the promotion of good practices and the effort to reduce poor practices require different policies and this may have organizational consequences: these two core activities require different competencies and professional values and may best be developed by different governmental bodies[38].

Is the OHS Management System a Useful Concept for OHS Policies ?

The Background to the OHS MS Debate

The debate on voluntary OHS management systems requirements as a tool for OHS policies is stimulated by the successes of similar environmental policies, especially the ISO 14001 standardization and the EMAS regulation and the associated option of certification of environmental management systems. Similar to environmental policy, the policy debate on OHS management systems is taking place in two arenas. The first is standardization, the second is voluntary (European) regulation.

The idea underlying the debate was already mentioned in the previous section: self-reflection by enterprises implies that health and safety should be integrated into the strategic and operational decision making within companies. Occupational health and safety management systems are the key tools for companies to achieve this. The debate is whether this should be fully the responsibility of the enterprises themselves, and also whether there should be harmonized and generally accepted OHS management system guidelines or specifications that allow for certification.

An important event in this debate was the international workshop organized by the International Standardization Organization (ISO), jointly with the International Labour Organization (ILO), held in September 1996 in Geneva[29], its aim was to discuss the need for an international global standard on occupational health and safety management systems (OHS MS).

The reason was that the ISO, after the successes of international standards for quality management (ISO 9000 series, stemming from 1987, updated in 1994) and environmental management (ISO 14001 series, stemming from 1996), wanted feedback from the different stakeholder groups with respect to the need for an ISO standard for OHS MS.

Standardization is based on consensus between stakeholders. In this arena the consensus concept means that all represented stakeholders accept a given position. That does not necessarily mean that all stakeholders are strongly in favour of the position taken, often controversies are overcome by compromises, and they can be more favourable to some parties than to others. If one of the stakeholders expresses fundamental objections to that position, there is no consensus, and another common position has to be developed.

There are two main types of standards, guidelines and specifications. Specifications give sets of requirements and are designed to make certification possible. ISO 9001/2 and ISO 14001 are specifications. The other standards of the ISO 9000 and 14000 series are guidelines. Guidelines give sets of recommendations and are not developed for certification purposes (for example, ISO 9004 and 14004).

The ISO/ILO discussion was organized in four stakeholder groups; respectively, employers' organizations, workers' organizations, governmental organizations (both from developed and less developed countries), and private and social insurance organizations and related interests.

The discussions at the workshop helped crystallize the debate on OHS MS. Many stakeholder groups had not yet seriously considered the OHS MS concept, but now they were forced to take positions in the debate. It goes without saying that most stakeholder groups were very cautious about such a new development.

After the negative outcome of the workshop, and the official vote by of the national standardization institutes thereafter (no need for global OHS MS standardization), the debate has shifted to other arenas. First of all, in early 1997 the Spanish standardization institute (AENOR) was quick to follow the ISO workshop with the proposal to develop a set of European OHS MS standards.

Since some European countries have already developed national guidelines (the Netherlands, Norway, Spain, UK), and since standardization activities on OHS MS are happening in several other European countries (for example, Denmark, Finland, Ireland, Poland), the idea of European harmonization is in itself a logical concept in an era of European integration and cooperation. However, so soon after the ISO workshop, most European countries were not in favour of starting a European standardization process.

In most European countries the debate continued, sometimes within the standardization process (for example, the Netherlands and Ireland), sometimes in a broader setting. After an intense national debate on the added value of OHS MS in Germany, a common position the government, social partners and social security agencies was arrived at[39]. Consequently, a German initiative emerged in autumn 1997 to develop EU harmonization of OHS MS requirements, not via standardization, but via a voluntary EU Regulation. This was an explicit choice in favour of the political process, which is more likely to deal adequately with the political aspects that are associated with OHS MS harmonization.

The German proposal was adopted by the Tripartite EU Committee on Safety, Hygiene and Health at Work at the end of 1997. An ad hoc working group will, jointly with the European Commission, undertake an overview of the available European OHS MS schemes and their strengths and weaknesses. At the end of 1998 the ad hoc working group will present this overview to the Committee for Safety, Hygiene and Health who will then decide how to proceed. One of the options is to decide to develop a voluntary regulation in the form of a European OHS management and audit scheme, very similar to EMAS. The debate on OHS MS harmonization is likely to continue until at least the year 2000.

When we review the debate so far, there are seven major issues that dominate the discussion.

1. the relationship of OHS MS harmonization with existing regulations
2. the added value of any management system scheme or standard
3. the involvement of workers' representatives in the international harmonization process
4. the impact of OHS MS standards on international trade
5. the major incentives for companies to implement an OHS MS
6. the limitations of standardization
7. the limitations of EU policy.

These seven issues will be discussed briefly in the following sections. As the debate is still going on, and many positions have already changed since the 1996 Geneva workshop, the intention is to give an overview of the arguments that are relevant in the debate, rather then trying to describe all the (temporary) positions.

The Relationship of OHS Management Systems Harmonization with Existing Regulations

There is much confusion on the relationship of standards (international, European or national) to existing national or international legislation. Do they interfere with legislation? Or do they form the start of a process leading to more or less legislation?

First of all, standards of the ISO type are in themselves always voluntary. They do not directly interfere with legislation. All standards include a stipulation that requirements of national legislations should be met. However, national governments can make references to standards in their legislation. In this way, standards designed for voluntary use, especially of the specification type, may become mandatory and may indirectly lead to new legislation.

On the other hand, unions and quite a few government bodies are afraid that OHS MS standardization will open the door for further deregulation and privatization. If standards become generally accepted, the added value of legislation in the same area will be reduced. Will standards replace existing laws? Might international standards reduce a government's freedom to determine its own legislation? In some countries, governments are also afraid that a sharp increase in third party certification (without any form of political control!) could lead to a substantial reduction in labour inspection activities. In other countries the labour inspections see it as an opportunity to focus their enforcement activities more precisely on the poor performers.

Even if governments explicitly guarantee that they will never make OHS MS standards mandatory, an important question for employers organizations remains, can governments be trusted in this respect? In fact there is a kind of mistrust on the part of the employers based on the experience that governments always make more regulations. Another factor is that future political changes may lead to other policies and positions currently advocated could be abandoned by a future government.

Finally, little is known about the possible impact on social insurance systems. In many European countries the existing social insurance systems are no longer self-supporting, mainly because they are rather expensive. It is very likely that they will be reformed in the coming years in one way or another. Several social security bodies also promote OHS, and they are afraid that OHS MS standardization and certification will be another external constraint on their activities. Remarkably, large international private insurance companies (for example, the world market leader in workers' compensation insurance, Liberty Mutual) took a similarly defensive position at the Geneva workshop.

Summarizing, it can be said that the relationship of international harmonization with existing legislation is unclear and leads to many questions for decision makers. In principle there are no essential conflicts between the two. Standardizaion of OHS MS can be used in the political debate both to decrease or to increase the number of legal obligations.

The Added Value of Any Management System Scheme or Standard

Another issue is the added value for companies of any management system standard or scheme, especially in the long term. The debate focuses on the long term impact of third-party certification of MS, and is largely based on lack of knowledge about the added value of quality and environmental management system standards at macro-level. The following issues play a role in the discussion.

- ISO 9000 is generally regarded as a success: globally more than 100000 companies have implemented quality management systems of the ISO 9000 type in 1997.
- Although certification based on ISO 9000 is basically a voluntary activity, in everyday practice it is often not very voluntary at all. When important customers want to buy only from companies that have an ISO 9000 certificate, very few companies are in a position to resist such pressure from the market.
- The front-runner companies that were the first to get an ISO 9000 certificate were able to use it as a marketing advantage. However, if the main competitors already have a certificate, a company considering the implementation of ISO 9000 can at best neutralize a competitive disadvantage. It is a clear example of the 'economic law of decreasing advantage'. What certainly remains are the structural costs for third-party certification, while the structural benefits (such as fewer internal costs due to rework) are not so clear (especially in comparison with competitors that have the same systems).
- The certification business is rapidly growing. This business is increasingly perceived by employers organizations as profiteers promoting new certification schemes, for example for OHS MS, because this means a growing market for them.
- There are, in most countries, companies that want OHS MS certificates. These are probably front-runner firms that want to gain competitive advantages. Although the desire to get an OHS MS certificate by front runner companies is legitimate, the international standardization circuit does not want to bear the responsibility for the introduction of a new certification circus.

- To prevent a certification circus, harmonization could be achieved via the development of guidelines that are not for certification purposes. However, it is only a small step to develop a certification scheme from a guideline. In this way guidelines can be used by companies and certification bodies as the basis for (future) certification. This is not simply theory, the existing guidelines (especially the BS 8800 and the NPR 5001), although explicitly not meant for certification purposes, are already used for certification.
- Finally, the question arises as to whether it is not illusory to try to prevent the development of OHS MS certification. As there is both market demand (from front runner companies that want a certificate) and market push (from certification bodies) it will not be easy to stop them from doing business with each other. It can be concluded that the added value of a standard for OHS MS and also of voluntary certification of OHS MS differs among companies and among countries. There is also a large element of political correctness in this debate.

The Involvement of Workers' Representatives in the International Harmonization Process

In EU countries workers or workers' representatives play an important role in all health and safety activities within companies, and also at national level. It is clear that for OHS MS the workers form an important stakeholder group. Their representatives (workers' councils at company level, unions at national and international level) should have a say in harmonization activities for OHS MS. The following issues play a role in this discussion.

- In several countries where guidelines for OHS MS have been developed or are being developed (for example, the Netherlands, UK, Australia), unions are involved in the standardization process for OHS MS. However, there are also examples where this has not been the case (Spain).
- There is no guarantee of union involvement in ISO's international standardization processes. In contrast, within the ILO such guarantees exist (also for employers), and an ILO convention could be a global alternative in this respect. At the European level the German preference for the Tripartite Committee on Safety, Hygiene and Health (rather than the standardization circuit) can also be understood in this way.
- There is no prior consensus among stakeholders as to how much the OHS MS concept at company level implies worker participation. Given the enormous differences in industrial relations practices throughout the world, this is a potential source of trouble in a global standardization process. It could imply that companies from countries with totalitarian regimes that do not allow free unions are by definition unable to comply with such a global standard for OHS MS. It will be easier to overcome differences in industrial relations regionally, for example, within the European Union or South-east Asia rather than at a global level.

In conclusion it can be stated that the close link of OHS MS with worker participation gives the debate on OHS MS harmonization a strong political connotation. These political aspects play a very dominant role in the present debate.

The Impact of OHS Management Systems Standards on International Trade

International standardization is good for international trade. But is this also true for standardization of management systems? In this respect there were many strongly contrasting statements made during the ISO workshop.

What can be learned from the experience with ISO 9000 in this respect?

Companies that do have an ISO 9000 certificate have easier market access to customers in other countries. ISO 9000 therefore clearly promotes international trade for companies that do have a certificate. This also explains why many international companies have these certificates. However, it becomes more difficult for companies that do not have such a certificate to sell their products to a customer in a new market, especially when that customer requires a certificate from its providers. ISO 9000 clearly can be a barrier to trade for the companies that do not have a certificate.

The overall evaluation of the impact of ISO 9000 on international trade is not clear. It is rather likely that the evaluation will be different from different perspectives. Multinational companies are generally positive, and many local companies are not so positive. Apart from this, the impact of OHS MS standards will certainly be less important than the impact of standards for quality management.

At the ISO workshop the World Business Council stated that OHS MS standards would generate a barrier to international trade, and this would be especially counter productive for the less developed countries. Representatives of quite a few less developed countries (for example, Columbia and Jamaica), however, were very much in favour of the development of OHS MS standards. They argued that their companies would never be taken seriously with respect to their social responsibility by the rich countries, given the fact that they had no adequate legislation, and that they could not expect it in the next 50 years. This would be used by companies in richer countries to say that their products were socially suspect; this is an existing barrier to trade. An international standard for OHS MS that allows for certification is the only way for companies from such countries to prove that their companies have achieved a high social standard. It will certainly promote international trade from this perspective.

It can be concluded that the positions taken in the debate on OHS MS and international trade are not based on objective studies that quantified the influence of management systems on international trade. The positions are mainly based on different perspectives of the respective bodies. This makes it rather unlikely that global consensus can be reached.

Major Incentives for Companies to Implement Management Systems

A vital aspect of a successful OHS self-regulation policy is that there should be clear incentives for companies to implement the management system. Again we can ask what can be learned from the experience with EMS.

The implementation of EMS is strongly promoted by a number of European governments. One of the means is to encourage companies by giving them the possibility to get an environmental permit on essentials. An environmental permit on essentials implies that the government does not include detailed means requirements in the permit, but only environmental performance criteria and the obligation to run an EMS, including the duty to communicate regularly with the government authorities about the progress being made and the difficulties that are encountered. The main benefits for companies are greater flexibility, less bureaucracy and, perhaps the most important, that environmental permits can be obtained much faster, for example, for complex installations in two months instead of one year. This makes it easier to invest in new installations at the very moment when market perspectives are promising.

The idea that the authorities can reward companies for implementation of a management system cannot easily be transferred to the OHS area, because there are no similar health and safety permits. Possible rewards in the OHS area could be:

- no (or less frequent) planned inspections by the labour inspectorate (only reactive inspections, after accidents, severe incidents, or complaints)
- more flexibility allowed in related issues such as working hours and flexibility of the labour force
- no legal obligations to associate themselves with an external OHS service or to have internal OHS experts
- differentiation in premiums for social or private insurance of worker compensation, accidents, etc.
- priority in the contracting of major projects commissioned by the government authorities (national, regional, local).

The possible rewards are likely to differ among countries. They will be influenced by the national OHS regulations and the existing social security systems. However, as far as we know, there are hitherto no European examples where such benefits are used structurally to promote OHS MS.

The limitations of Standardization

If harmonization of OHS MS requirements is useful, the question arises as to whether the standardization circuit or the political (European) policy circuit is the best option. In this and the next section we will briefly discuss these options.

First of all, it can be said that the ISO has gained more strategic impact via the ISO 9000 series of standards (for quality management systems) than it had ever gained by making thousands of

technical standards. The core activity of standardization institutes is and remains, however, to develop international technical standards to harmonize requirements between the member states, and thus to reduce barriers to trade. As the impact of management system standardization on international trade is not univocal, it cannot be said that the development of standards for OHS MS belongs to the core activity of the standardization institutes.

Moreover, the standardization institutes have little or no experience with the political topics that are associated with OHS MS standardization, such as industrial relations and worker participation. There are only some exceptions at national level in a limited number of countries. It remains a question whether the consensus model of the standardization institutes can be productive in the case of items that are at least as political as technical. This limits the potential role of the standardization institutes.

The Limitations of EU Policy

EU OHS policy can so far be characterized as focusing on the framework directive and complementary directives for specific OHS topics. These directives imply mandatory regulation at national level. There is little tradition and experience in EU voluntary regulation on OHS.

The most extensive policy option is to explore the option of an EMAS type regulation for health and safety. A common conclusion of the German Federal Ministry of Labour and the German social partners is that the standardization organizations are not the appropriate network to develop voluntary guidelines for occupational health and safety. OHS is the responsibility of the social partners and governments, and standardization processes are not regarded as a good forum to deal with this political process[39]. As a consequence the option of a voluntary EU OHS management and audit scheme regulation was proposed by the German Federal Ministry of Labour to the European Commission at the end of 1997. This proposal was adopted by the Tripartite EU Committee for Safety, Hygiene and Health at Work of the European Commission's DG V at the end of 1997. An ad hoc group of this committee, composed of representatives of the social partners and the governments, will take care of the preparatory activities. After exploratory activities the ad hoc group intends to be able to make concrete plans by the end of 1998.

The option of a voluntary OHS management and audit scheme regulation, especially focusing on medium-sized companies, is being discussed among researchers in Sweden, and will be the focus of one of the workshops in the Workshop 2000 Series, a series of preparatory activities for the Swedish EU Presidency in the year 2000[40].

There have been debates on regulatory reform and privatizing and on the subsidiarity principle. It is likely that a strategic topic such as a voluntary occupational health and safety management and audit scheme regulation will give rise to renewed political debates on the relationship with existing EU legislation. This may complicate the debate and the political process. However, compared to the standardization circuit, the EU arena is, in principle, the right place for a political debate.

As the cooperation between DG XI (Evironment) and DG V (Safety and Health at Work) of the European Commission is very limited, it is not clear whether the benefit from the experience with the EMAS regulation policy can be optimally used in the development of similar OHS policies.

The EU arena seems to be the right place for dealing with the political aspects of defining OHS MS system requirements. However, the EU OHS policy bodies have little experience with management system thinking or with voluntary regulation.

The Interaction of Environmental Policies with Health and Safety

What New Elements of Environmental Policies are Valuable for Health and Safety Policies ?

Promotional activities

The EMAS Regulation is an example of a modern environmental policy, promoting environmental management and cleaner technologies. Making the analogy with health and safety we will discuss the promotion of inherently safer and healthier technologies, health and safety management, and other health and safety promotional activities.

Promoting inherently healthier and safer technologies

The EMAS Regulation promotes the implementation of best available technologies (BAT) (from an environmental, cleaner production perspective). A large European database on BAT is now being developed; this will offer companies and external verifiers and those involved in awarding environmental permits the possibility of checking whether the technology in use is actually BAT or not. This raises the question of how companies, but also labour inspectors, can assess whether companies use – or are intending to invest in – BAT from an inherently safer and healthier point of view. Is a similar database for inherently safer and healthier technologies needed?

In the USA – where promoting inherently safer technologies is regarded as a relevant issue – the labour inspectorate is discussing the option of a proactive policy to foster inherent safety after accidents. The central purpose is to offer companies the choice between prosecution or paying fines and getting more negative publicity, or, in cases where the company is, following an accident, actually investing substantially in inherently safer technologies, to waive the prosecution and the fine[6]. .

A recent critical investigation of several databases for cleaner production showed that many of the best available environmental technologies are often counter productive for OHS[41]. From a users' perspective OHS technological solutions databases should be easily compatible with environmental databases, and integral databases that foster cleaner and inherently safer and healthier technologies may be an even better option.

Stimulating health and safety management

The main ideas about stimulating OHS Management Systems are that they:

- are an expression of the sense of responsibility of an organisation
- focus on prevention and continuous improvement
- may give health and safety management a more strategic value
- include guarantees for control at system level via periodic audits and management reviews.

Other promotional activities

Research[38] has shown that environmental stimulation and enforcement activities require other cultures in the organization, and different skills, attitudes and self-definitions from the people involved. The conclusion was that (environmental) inspectors and promoters of cleaner production should not be the same people, and can best be organized in different units, with their own professional competencies and culture.

A similar contrast in cultures can be observed in many cases between the departments (both within companies and governmental agencies) that promote occupational health and safety (focusing on risk-reduction), and those who foster workplace health promotion (stimulating healthier lifestyles). The question about the organizational consequences for these two varying activities (for example, for enforcement and promotional activities of labour inspections) could be very relevant.

Enforcement activities

New policies to promote management systems and to foster inherently safer and cleaner production or to boost workplace health promotion will undoubtedly have an impact on enforcement activities.

If governments promote standardization and certification or verification, they will have to face the question of how enforcement activities relate to activities of these independent (commercial?) certifiers. There are three relevant aspects: the changing added value of government inspections, the consequences for inspection strategies and competencies of inspectors, and the remaining political accountability.

Changing added value

When companies arrange for their management systems to be periodically audited by external independent and competent bodies, the added value of inspections by the labour inspectorate will tend to decrease. In the UK, HSE officials say they will never duplicate the activities of certifying bodies. What then is the added value that the labour inspectorate can generate? It is also important to be aware that labour inspectorate always face dilemmas when they carry out system inspections: audits require a relatively large amount of inspection time per company, and this may easily lead to a situation where too much time, relatively, is spent on inspections in companies with relatively good health and safety performances.

To safeguard added value, planned inspections can be focused on those companies that do not have OHS MS, by definition most of the SMEs. Ultimately, they will always respond to accidents and complaints and these can be seen as indicators of serious defects in the management system that fully justify labour inspection activities[42].

Consequences for inspection strategies and competencies of inspectors
If companies develop management systems and become used to getting feedback at system level (instead of feedback on problems at operational level), they will expect to communicate with the labour inspectorate at system level. Inspectors who put too much emphasis on operational problems will tend to see their credibility decrease for this target group. New inspection policies, including the option of OHS external audits, may be a good response to this development. An aspect that should be further developed is simple methodologies to use concrete problems on the shop floor as indicators of weaknesses in the existing management system. The latter tools will be very important for in-company use and also as tools for renewed workers' participation.

Political accountability
The minister responsible for OHS will remain politically accountable, also in cases where part of the enforcement policy will depend on government trust in the activities of registrars and boards of accreditation. The crucial question is: what happens to the minister's political credibility if the certification system does not function adequately?

The commercial interests of competing certifying bodies may lead to competition on price instead of quality. This can lead to the introduction of less reliable auditing practices. This is not merely a theoretical discussion, as there are some examples of registrars giving certificates for ISO 14001, 9001/2 and Safety Systems for Contractors on improper grounds[43]. Depending on the minister's perception of the reliability of the certification system, this will limit the minister's commitment to these kinds of innovations.

Should Environmental and Health and Safety Policies be Aligned or Integrated?

Impact on mandatory requirements

The EMAS regulation sometimes overlaps with mandatory requirements. Two examples will be given. As the environmental performance of companies comprises environmental safety, EMAS will partly overlap with the post-Seveso II requirements (these are to prevent major hazards, especially in chemical companies). This guideline requires that companies prone to major accidents manage process safety structurally. It also stimulates the use of inherently safer technologies. What will be the consequences for the safety management system when an EMAS audit team reviews only part of it?

Another obvious interference may occur in the Scandinavian countries with internal control legislation, according to this law it is mandatory to have an environmental and health and safety management system (Norway) or a health and safety management system (Sweden).

Early exploratory research in the Netherlands on alignment of regulations and enforcement for working conditions, environment and quality, did not, however, demonstrate that companies were seriously hindered by non-alignment of governmental activities. However, this need may become more prominent when more companies have developed integral management systems[44].

Joint promotional programmes?

Hitherto, there are very few examples of joint promotional programmes at national policy level. However, the Responsible Care Programme, which covers both environmental protection and health and safety, is a inspiring industry initiative which clarifies that joint promotion is a serious option.

At international level, the UN environmental programme UNEP stimulates through its industry and environmental initiatives the fostering of cleaner production and also the improvement of health and safety[3]. The OECD also deems overlaps with health and safety to be important, especially for Central and Eastern Europe[44].

Joint inspection?

Companies do not want to be subject to external control over and over again. They prefer a one-stop-shop, an integral auditing process that is much less time consuming than separate audits.

That raises the question of the one-stop-shop concept for labour inspectorate and environmental inspectorates (joint enforcement). Norway has already gained considerable experience with joint inspections due to its Internal Control Regulations.

However, in other countries that do not have an obligation of internal control, the one-stop-shop for integral auditing may become just as important, both for registrars and for government inspectorates. What does this imply for the identity, the tools, the qualifications and the manpower of the labour inspectorate?

Integration or alignment?

With regard to integration it seems that there are more disadvantages then advantages associated with integrating these policy areas. Although they want to influence the same enterprises, environmental policies are rather different from social policies, and in addition the most important stakeholders overlap only in part.

It seems more productive to strive for alignment of policy initiatives, for awareness that the management system philosophy is the same for environmental protection or for health and safety, and for the exchange of information on lessons learned between the respective policy fields.

A recent development that may facilitate the alignment of policy areas in the perspective of sustainable development is the concept of national systems to support good practices in health and environment management. This concept is now in development as a preparatory activity for the Third European Ministers' Conference on Health and Environment which will be held in London in 1999[21].

Conclusions at Macro-policy Level, in the Wider Perspective of Sustainable Development

The EMAS Regulation offers both opportunities and threats for OHS policy agencies and labour inspectorates. The German proposal to develop a kind of OHS management and audit scheme regulation which was adopted by the Tripartite EU Council for Safety, Hygiene and Health at Work at the end of 1997 can be regarded as an attempt to use the new opportunities proactively. Independent of the outcome of this policy process, it can be expected that it will lead to rather fundamental discussions in the EU about the strategic importance of OHS management systems, and the value of various elements of environmental policies for health and safety policies.

The EMAS Regulation is based on several policy aspects, such as:

- recognition of the importance of modern management systems for companies, also in the perspective of a self-regulation policy
- the positive role that certification/registration (based on third-party verification) can play in promoting improved performances of companies
- using societal acceptance and a good company image as incentives for improvement
- promoting the interaction between company and external stakeholders (for example, neighbours, customers, consumers, NGOs) as a policy objective
- trying to make good environmental performance a competitive advantage
- making use of market incentives stemming from customer companies that require an EMAS certificate from their providers as part of their procurement procedure.

These elements for successful environmental policies can, in principle, also be used in OHS policies. However, we have seen that the OHS area is much more political in character than environmental policy, due to the fact that OHS policy comprises, to a certain extent, industrial relations and worker participation aspects.

Reviewing the EMAS regulation in terms of its consequences for OHS policies highlights interesting perspectives and consequently new policy options to foster sustainable development. There will also be consequences for the internal organization of inspections and the cooperation between government departments for the environment, health and labour.

It must, however, be kept in mind that management systems are mainly useful for medium-sized (>50) and large enterprises. For smaller enterprises the management system concept appears to be of only limited value.

For small enterprises the role of intermediary organizations, especially branch organizations, will be essential. Support systems at sector level for environmental management, but also for health and safety management, form an interesting option for joint policy initiatives, as it is very clear that small companies cannot afford to implement more than one management system.

Annex

Five Case Studies of EMAS/ISO 14001 Implementation at Company Level

Case 1. Axel Springer Publishing, Offset Printing Plant, Ahrensburg, Germany

1. The Organization

About 700 employees work at the Springer company's offset printing plant in the small town of Ahrensburg near Hamburg. Founded in 1982, the offset printing is one of the company's six production plants. In addition, Springer owns two publishing houses in Berlin and Hamburg. In total, Springer's staff consists of around 12000 employees.

The offset printing plant produces mainly company owned newspapers. The plant is structured into four business units: type forme production, rotation (10 rotary offset presses), processing and technical maintenance. The main environmental hazards from the primary process originate from the use of printing inks and organic solvents. Organic solvents are also one of the most urgent OHS problems. Shift work and noise are the two other main health hazards.

2. Aims and Strategy

Public opinion was a strong motivation for the Springer company to implement environmental management. Several campaigns by Greenpeace drew attention to the publisher's responsibility for the global destruction of forests. EMAS contains a public relations aspect and thus promises a positive impact on a company's public image. This was probably the main reason to choose EMAS rather than ISO 14001. The offset printing plant was chosen as the company's model or pilot plant. EMAS was to be implemented here first, for later evaluation and transfer to Springer's other sites. Thus, the Ahrensburg plant was validated at a very early date (November 1995).

At company level, four main aspects of environmental policy are pursued: editorial competence; acquisition of raw materials with care for the environment; efficient use of energy and materials; and reduction of waste and emissions. The site's environmental guidelines do not specifically include aims for health and safety. The central items are material efficiency and waste reduction, for which various measures are planned. Concrete examples for environmental objectives are: reduction of the use of photo-chemicals by 40 per cent; reduction of energy and material consumption by 30 per cent; reduction of organic solvents emissions by 30 per cent. So far, mainly technical measures were implemented at the offset printing site, some in the years preceding validation. For example, machinery for recycling used printing inks was developed, which enables the annual re-use of 12 tons of printing inks. Through recycling of cleaning solvents, the amount of waste was reduced by 90 per cent. In addition, thermal recovery techniques are used at the rotary presses to save energy.

The offset printing plant specifically stresses its commitment to continual improvement of environmental performance. Whether this is actually put into practice and extended towards communicative and organisational measures remains to be proved in the revalidation planned for the end of 1998.

3. Implementation

At company level, Springer installed an environmental working group, which consists of senior management representatives from all eight sites. In addition, an environmental staff department was created as part of the Board of Directors. The implementation at the Ahrensburg plant was handled with extensive external consulting. An audit team, consisting of the consultants and management representatives of the site, was set up and worked for approximately a year and a half. The site's managing director now carries environmental responsibility as management representative. The senior OHS engineer is responsible for the management system's development and for the implementation of the environmental programme. Thus an important OHS activist was included in EMAS implementation from a very early stage. The actual stimulus for the integration of health aspects into the environmental management was an initiative of the works council. Since the 1980s, the works council had been actively campaigning for the substitution of organic solvents by vegetable oils, with notable achievements. From 1985 until 1991, the particularly health-hazardous Aromate, which used to make up 22 per cent of consumed solvents, was completely phased out. Through substitution of substances, the burning point of mixtures of organic solvents was increased, enabling a considerable reduction of evaporation. Since 1990, a number of tests have been run with vegetable cleaning agents. The works council regarded organic solvents as the central link between environmental and OHS aspects, since they present both environmental and health hazards.

The works council successfully suggested adding environmental responsibilities to the existing tasks of the OHS committees. The OHS committee is compulsory under German law and consists of representatives of both management and works council, workers' safety representatives, the OHS officers and the medical officer. These latter expert functions are also compulsory, though

external consultants may be engaged. This new OHSE committee is now the central element of the environmental management system. It consists of the plant's managing director, the employees officially responsible for fire protection, emissions, waste management and transport of hazardous materials, the OHS officers, workers' safety representatives, the medical officer and two members of the works council.

4. Monitoring and Control

Technical changes which include cost reductions are at the forefront of the environmental programme. In the field of waste management, organizational measures are also planned. The level of implementation will be registered on a regular basis. Input and output, in particular (materials, energy, water, emissions and waste), are continuously controlled. Knowledge of environmental issues was declared to be a key qualification for everyone in the company, and is to be integrated into the company's training activities. It is, however, as yet not quite clear how the employees' competence will be optimized and evaluated. The most important initiative towards effective training was launched by the works council, who developed a one-day course on basic environmental knowledge. This course has been held several times, and the majority of the plant's staff have participated.

The works council also plays an active part in the improvement of the OHSE management system. Projects have been carried out on the basis of proposals developed by the works council. For example, all materials currently used at the plant are being listed in a register, and an EDP-based system of environmental controlling is being developed and implemented.

5. Evaluation and Organizational Learning

Conflicts between OHS and environmental priorities are not discussed at the plant. This is probably due to the fact that OHSE management initially picked up the issue of hazardous substances, which is a classic interface subject. Innovative elements with regard to new markets or products are hardly noticeable in the plant's environmental management. This is not surprising, since as a company owned printing site Ahrensburg has a very clearly defined range of tasks.

Regarding the production of paper (as the main raw material), a global responsibility is acknowledged. As a first reaction to the above mentioned Greenpeace campaigns, standards were defined which are to be met by the plant's paper suppliers. These standards contain far more than a mere ideology of replacing felled trees: they include aspects such as selective wood harvesting for the protection of the variety of species, consideration and co-operation with native peoples etc.

6. Communication and Cooperation

Since public opinion played an important role for participation in EMAS, the general public is seen as a major stakeholder. The regional public on the other hand is considered as a less important addressee. The environmental statement, for example, does not name a contact person at the plant for enquiries from the neighbourhood. Internally, environmental issues will be continually discussed. Workers are kept informed by regular meetings and personal letters.

Furthermore, environmental aspects have been integrated into the regular compulsory OHS instructions. Workers can submit their own suggestions and ideas for the protection of the environment via an internal proposal system. The works council is trying to integrate workers more thoroughly into the management system by means of training and motivation.

7. Notable findings

Participation in EMAS resulted from strong external pressure and initiative. The environmental management system is not as yet deeply embedded in the staff's awareness and performance. During the process, however, an environment-friendly climate did emerge at the plant, which enables further development. The works council in particular makes the most of this potential by using both organizational and factual aspects (organic solvents) to link the environmental management system with OHS, using the issue of health as a central theme to heighten workers' awareness, furthering the quality of both the management system and the environmental performance through its own projects and proposals.

It is worth noting that two highly motivated members of the works council act as co-managers, actively participating in the implementation of the projects. Their input combines ecological competence, which they voluntarily acquired through evening classes, and considerable experience in OHS, gained during years of dealing with health hazards of organic solvents. Here, they developed methods of training, feedback and motivation to actively involve the workers – a concept which they are now successfully applying to environmental issues.

Case 2. ELAIS, Production of Edible Oils and Fats, Athens, Greece

1. The Organization

ELAIS is the oldest (founded in 1920) and largest Greek manufacturer of edible oils and fats producing olive oils, margarines, shortenings and seed oil, mainly for the local market, but also exporting to the United States, Canada and to other European countries.

The factory is located in Athens. The company employs approximately 435 staff, has a turnover of about £100m, and is registered on the Athens Stock Exchange. The majority shareholder is Unilever, the Anglo-Dutch food and detergents company.

The corporate image is based on total quality principles and on exemplary and documented actions with respect to consumers (safety, hygiene, quality), to employees (safety, medical care, working conditions), to shareholders (stability, value, dividends) and to society (safety, environment, integrity, support).

ELAIS is an ISO 9001 and ISO 14001 certified company and was a finalist in 1996 for the European Quality Award.

2. Aims and Strategy

ELAIS wishes to be part of a sustainable future, in which economic growth combines with sound environmental management to meet the needs and aspirations of people throughout the world. ELAIS has clearly defined its environmental policy and has made this publicly available.

The company is committed to:

- applying all practices which reduce the environmental impact of their industrial operations, that are scientifically documented and commonly approved
- reviewing and continually improving the environmental impact of their products, services and operations
- communicating and promoting their environmental goals and targets and refrain from any misleading statements or advertising.

Finalization, planning and evaluation of environmental objectives is an annual process. Performance is indicated by monitoring certain significant environmental parameters.

ELAIS is in constant and close cooperation with the central support services of Unilever and the sister factories in the same business group, thus sharing know how, problems, solutions and experience.

Unilever support is particularly important in advanced manufacturing technology installation.

Key areas that involve either high-risk operations (i.e. boiler) or general plant safety and reliability are audited.

ISO 14001 certification is the first step towards total commitment to sustainability. EMAS will take longer to reach, because ELAIS believes that the environmental statement should not be considered in connection with external verifiers only, but that the general public should also have a part in it, by approving and agreeing the verifiers' statement. The public has different criteria from the verifiers. These need to be met in advance if the long term objective is to reach social symbiosis.

External certification provides the organization with the assurance that what is done and what is planned for the future meets the criteria of experienced and distinguished external auditors. This is an internal improvement exercise and certification is not used as a marketing tool.

There is demonstrable commitment to continual improvement in safety, environment, quality and, of course, business results as the company has adopted the European model for business excellence to be the guiding framework for its operations.

All of the above issues are included in an integrated business process documentation system which allows continuous updating and information access to all staff and operates in a Lotus Notes database environment.

3. Implementation

The integration of the environmental health and safety guidelines at each operation level was straightforward since the infrastructure was there long before the company decided to reach certification. Training in total quality started in 1991, mapping of procedures and work instructions started in 1992. ISO 9001 certification was achieved in 1994. It was easy to add the necessary environmental, health and safety aspects to that system. This was confirmed by ISO 14001 certification in 1996. However, there was a lot of technical work that had to be done based on a diagnostic audit that was carried out in 1995 by Unilever's environmental experts. It took about two years to complete major projects involving substantial investment in production and manufacturing processes following the best available technology not entailing excessive costs principle.

The commitment of top executives was clear from the very beginning. The company chairman participated in the initial training of managers and personally analysed the corporate and ELAIS policy and strategy.

The day-to-day business is run through the Company Environment Committee founded in 1989 and composed of members from all company functions, i.e. technical, legal, research and development, marketing, accounting, information technology, etc.

4. Monitoring and Control

There is adequate management information available through a number of communication tools.

All environment projects and project status are given in a particular database. Company Environment Committee meeting minutes are communicated widely and address issues such as project status review, meeting targets, legal compliance, training, etc. A number of parameters are also benchmarked against other companies, for example, fuel, electricity and water consumption, waste levels and lost time accidents, etc.

The cooperation of the company with the environmental department of the Aegean University that has led to the development of a more effective effluent treatment technique is one of the examples of actions supported by the management system.

The added value of the internal or external audits of the company is that almost invariably, environmental benefits go in parallel with financial benefits and, at staff level, that environmental awareness is promoted and that the need for sustainability becomes apparent to everybody.

5. Evaluation and Organizational Learning

The role of the management review is to assess progress on the identified objectives; to observe deviations and to initiate corrective actions, if the identified deviations result from organizational weakness. Annual environmental targets are agreed and communicated to all staff, annual performance throughout the year is monitored and a final performance/achievement report is communicated by year-end to all staff.

Costs and benefits are always taken into account. For every project, as well as the standard financial appraisal, safety, environment and quality aspects are also considered. The conclusion of the company is that the widespread assumption that 'investments for environment add costs to products' is not valid any more. Social costs should be taken into account. Other technology options should be analysed. Almost invariably the outcome is that what is environmentally better is also financially preferable.

This, being a totally integrated approach in perfect harmony with the company's business objectives, leads to no conflicts between environmental and other priorities. The SHE policies are totally in line with the company business principles, communicated to all staff and are fully supported by top management.

6. Communication and Cooperation

The general public, in the form of the consumers of company products, is clearly an important stakeholder. Certain activities are addressed to them, analysed further below. The factory neighbours are also priority stakeholders and their views are greatly appreciated by the company management.

A principal requirement for the survival of the company is the continual improvement in every field of operations. All company staff take part in focus teams and project teams. Focus teams meet approximately once a month and the environmental issues (ideas, proposals, project review, etc.) are standard agenda items. Bidirectional communication at all company levels is a basic requirement of total quality. This is achieved in ELAIS by monthly meetings of the Steering Committee (Board of Directors and Total Quality Administrators), the Lead Teams (departmental first line organizations) and the Focus Teams (function or section dependent organization, for example, electricians, laboratory analysts).

Project teams undertake the implementation of certain projects. In September 1997, about 60 projects for the environment were reported on, of which 35 were completed.

Concerning dialogue with the public, certain actions are undertaken. Some characteristic examples include:

- Every year about 2 000 people visit the factory to witness the commitment of the company to product quality, occupational safety and to sustainability through proper environmental management. In the introductory presentation of the company's history and product portfolio, environmental performance is discussed and targets explained. The continual improvement methodology is described and upon completion of their visit, it is suggested that visitors provide their feedback by taking an active part in the system and completing an Opportunity for Improvement form.
- In the business world, the open dialogue is demonstrated by various presentations given by senior managers of ELAIS at conferences, seminars and other similar activities where problems, solutions and experiences are shared by all present.
- Interviews of ELAIS staff by a number of business reviews act very much in a catalytic way, to promote the interests of the various organizations, to accelerate the need for ISO 14001 certification and to attract attention in order to achieve the necessary focus on sustainability.
- In the social world ELAIS has coordinated its activities with the other two sister companies of Unilever in Greece. About 200 leaflets have been distributed analysing the company's environmental policy, targets, achievements and plans with the aim of informing, educating and harmonizing views and opinions on sustainability. The leaflets were addressed to key opinon formers in the public and private sectors including senior public servants, academic professors and board members of organizations.

To promote awareness among all cooperating parties (suppliers, customers, subcontractors, distribution agents) ELAIS has printed a special leaflet entitled *We and the Environment* of which approximately 5000 copies were published.

The interest of ELAIS in sustainability is expressed not only in its efforts towards reduction of its environmental impact, but extends further into the responsibility to increase public awareness and motivate the consumers. To this end ELAIS established cooperation with the World Wildlife Fund (WWF) in 1995. This is demonstrated by two examples: environmental education with the topic Mediterranean forests, and protection of species under threat. The programme included financial support for WWF and communication to the public by distributing 5 000 000 leaflets on margarine tubs with photos of the animal species under threat.

The main external impacts of SHE management on markets, product, image, etc., cannot be easily established. ELAIS is a pioneer in that field. The actions of ELAIS are guided by its mission.

ELAIS is looking forward to the development of more accurate environmental impact measuring methodologies in the hope that this will provide more convincing examples to many more organizations and will speed up the whole process. They communicate this belief to others and they constantly try to be documented and persuasive.

7. Notable Findings

ELAIS enjoys a dominant market position and a widely accepted and long established recognition both by consumers for the quality of its products and by environmental as well as OSH specialists for its performance in the relevant fields, which are also its strong points.

One example of the innovative activities of ELAIS is the fact that it was the only Greek company which agreed to participate in the Inherent Safety Project, aiming at eliminating environmental and OSH risks for its new oil refinery plant.

An exemplary initiative was its cooperation with a nearby school, to which ELAIS provides steam during winter for the heating needs of the students and teachers. ELAIS has covered all the costs of the planning and construction of that heating installation.

Case 3. Allers Bedrijfswagens, Truck Service, Tegelen, the Netherlands

1. The Organization

Allers Bedrijfswagens was established in 1945. After World War II there was a great shortage of trucks, needed for reconstruction work in various European countries. Allers Bedrijfswagens bought army trucks from Allied army dumps and converted them into trucks fit for civilian use. Over the years the company changed according to the wishes of the customers: transformation of truck bodies, revision of engines and repair. In 1957 the company became the official dealer for DAF trucks in the regions North and Mid Limburg.

Today Allers Bedrijfswagens has five sites in the Netherlands and one site in Germany, with about 160 employees in total and a yearly turnover of about NLG 72 million (1997). Its main activities are sales of heavy (DAF) and light (LDV, Isuzu) trucks, repairs and maintenance of trucks, truck rental and sales of truck parts. Due to recent growth (1995), a hyper modern workshop and warehouse have been built in Venlo. Allers Bedrijfswagens is aiming for a total service concept where they can assist the transporter in all possible ways, for example by also offering guarded parking space for trucks.

Each site operates as a separate business unit with its own targets and budget. Management and administration are centralized in the main site in Tegelen.

Environmental hazards in the primary process originate mainly from the maintenance and repair activities: waste (motor oil, metals, asbestos from brakes, paint); waste water (oil, gasoline, acid (batteries) and emission of organic volatiles into the air (spraying of paint). Health and safety risks are also primarily linked to the maintenance and repair activities: physically intensive work; climate differences in the workshops; inhalation of organic volatiles and (removed) paint particles.

2. Aims and Strategy

The general philosophy of Allers Bedrijfswagens is that care for the environment, health and safety and quality are conditions for a healthy organization.

Occupational health and safety

Allers Bedrijfswagens is convinced that good health and safety is essential to achieve company targets. Optimal care for safety, health and well-being will increase work performance. Moreover, good health and safety are believed to reduce sickness absenteeism and company costs. In the future a shortage in the labour market is foreseen; it is therefore important to look after the existing employees. Besides these company driven motives, health and safety are becoming more and more important due to the privatization of the social security system and the growing influence of the Act on Working Conditions. Allers Bedrijfswagens has been optimizing health

and safety care since the beginning of the 1990s. An important aim is that employees at all levels are responsible with respect to health and safety. For that reason structuring, cooperation and consideration at all levels are important. The Annual Working Conditions Plan, based on a risk inventory and evaluation, is an important tool to realize the aims and visions mentioned above.

The aims on health and safety are mainly translated in terms of qualitative targets such as improvement of employee awareness, improvement of relations with the workers' participation committee and appointment of a 'safety man of the week'.

Environment

Allers Bedrijfswagens believes that the company has a responsibility to its environment. It therefore strives to minimize negative environmental effects. The bottom line is determined by national laws and permits of local governments.

Each site has its own environmental programme and targets derived from dealing with waste, waste water, emissions into the air of volatile organic compounds and use of water, gas and electricity.

Management of Quality, Environment, Health and Safety

In order to be able to carry out work for the Ministry of Defence, the company set up a management system according to the Allied Quality Assurance Publications (AQAP). This led to the AQAP 4 ed 2 certificate in 1989. This certificate and the growing demand in the EU for quality systems motivated the setting up of a quality system EN ISO 9002. Allers Bedrijfswagens was the first company in Europe in this field to achieve an EN ISO 9002 certificate (1989) for its site in Tegelen. Today all of its sites comply with EN ISO 9002.

In 1994 Allers Bedrijfswagens was certified for BS 7750 for its environmental management system. It took only six months to set up the system and have it certified. This was mainly due to synergetic advantages with EN ISO 9002 and a strong management commitment.

The reason for having the environmental management system (EMS) certified is the belief that an external party plays a stimulating role in setting up and implementing an EMS. The certificate is also used for public relations. In 1997 the environmental management system was certified under EN ISO 14001. EMS, in principle complies, with the demands of EMAS. Allers Bedrijfswagens considers the added value of EMAS too small i.e. not very well known and therefore does not strive for EMAS certification.

With respect to occupational health and safety Allers Bedrijfswagens is looking at possibilities for normalization and certification (Safety Checklist for Contractors or NPR 5001– a Dutch guideline on the management of occupational health and safety). The Triparite EU Committee for Safety, Hygiene and Health at Work has chosen Allers Bedrijfswagens as an example of good

management of safety and health. This led to a 'Safe Prevent Meeting 1997' at Allers Bedrijfswagens, supported by the European Commission.

3. Implementation

A very important aspect is management commitment. Top management is very concerned with matters concerning quality, the environment and safety and health. As a result of this Allers Bedrijfswagens was able to be certified for AQAP, EN ISO 9002 and BS 7750 at very short notice. This management commitment also results in approving projects to create better working conditions for workers, without necessarily having a clear insight into the financial benefits. The management believes in the benefits and therefore the projects are implemented. One example is heated floors in the new work-shop in Venlo.

The management of quality, the environment and health and safety is done by one person, the QSHE manager. The human resources manager coordinates matters such as sickness absenteeism and well-being. The aim is to lay down responsibilities for QSHE throughout the ranks of the organization. The floor managers are responsible for carrying out the QSHE plans. This is specified in their job description.

Health and safety items are integrated into the EMS as much as possible. People on the floor see no difference between quality, health and safety and environmental items.

Allers Bedrijfswagens aim to do as much as possible by itself without external aid. This applies for example, to CE marking and inspection of cranes.

4. Monitoring and Control

Each week inspections on the environment and health and safety are carried out on every site by the 'safety man of the week'. In particular, behavioural aspects are inspected, such as blockage of emergency exits, the use of safety glasses, ear protection and dust masks, the separation of waste and the correct storage of gas containers. Corrective actions can, when necessary, be undertaken on a weekly basis merely by instruction and improving awareness.

On each site registrations are made of the following:

- Waste: each year quantities of the different kinds of waste are compared with previous years. It is not the total quantity which is important, as it depends on the workload, but the correct separation of waste. When large differences occur, an explanation is sought.
- Waste water: on every site samples are taken of the waste water twice a year. The results are compared with the waste water permits. If the permitted concentrations are exceeded, corrective actions will be undertaken.
- Emissions of volatile organic compounds into the air: emissions are calculated based on working hours and concentrations of organic solvents in the paints used. These are compared

with the demands of the environmental permit. Because the demands are not clear, comparison is subjective. By using a more efficient spraying technique (HVLP) the use of paint is reduced by 15 per cent.

- Use of water, gas and electricity: consumption is registered on each site. It is mainly dependent on workload and weather conditions and therefore not easy to influence.

Sickness absenteeism and accidents are registered and compared with previous years.

Once every three years a full risk inventory and evaluation is carried out on each site with respect to safety and health. These form the basis for the working conditions year plans. The plans are evaluated in the working conditions year report.

The EMS is audited in accordance with the specifications of EN ISO 14001.

5. Evaluation and Organizational Learning

Allers Bedrijfswagens is mainly a service organization, where SHE technology can be applied only in a limited way, for example, the use of more efficient spraying techniques for painting. Being a service driven organization, the human factor is very important. Allers Bedrijfswagens believes in preparing and keeping its employees for the future through personal responsibility, training and education in psychosocial skills, and good working conditions (for example, the heated floor in the workshop is aimed at longer productivity of older workers).

In practice there are no conflicts in priorities between the environment and occupational health and safety. Differences in priorities are nevertheless reported between quality and health and safety: speed versus safety.

The general concept – that care for quality, environment and safety and health are conditions for a healthy and successful company – is gaining ground.

6. Communication and Cooperation

Last year emphasis was placed on the translation of SHE policy to the working floor. On each site the employees were informed about matters concerning the use of protection tools, how to deal with waste and the storage of dangerous substances. The result of these meetings was the creation of the 'safety man of the week'. In the work meetings on each site, the employees are encouraged to bring forward ideas concerning QSHE (bottom-up). These work meetings are also used by the managers (top-down) to discuss matters and procedures concerning QSHE.

The workers' committee on working conditions meets regularly to discuss matters concerning working conditions and safety, to prepare actions, to execute actions and to monitor progress.

Important stakeholders for Allers Bedrijfswagens are the clients, the general public (as a provider of employees or as a neighbour) and the government.

7. Notable Findings

In this case commitment from management at the highest level contributes significantly to the successful introduction of management systems for quality, environment and safety and health. The belief that care for quality, safety and health and the environment are conditions for a successful organization is the basis for this commitment.

The management of the environment and occupational health and safety are strongly interwoven. These two management areas profited from the experience gained by the certification of the quality system, which is gaining ground in the company.

There are in practice no conflicts between environment and occupational health and safety priorities, although in theory they might exist. The only conflicts are between quality (speed, demands of clients) and health and safety.

Case 4. ABB Kabel AB, Cable Manufacturing, Nässjö, Sweden

1. The Organization

ABB Kabel AB is a part of the Asea Brown Boveri (ABB) group and is one of the oldest cable manufacturing companies in the world. Cable production started in 1870 in Stockholm and was moved to Nässjö, Sweden in 1993. ABB Kabel supplies a wide variety of cables for signal and power transmission for industry and power stations. The most important market is northern Europe but the company is active world-wide. ABB Kabel's turnover is about $64m yearly.

ABB Kabel has approximately 180 employees. Besides the managing director and his staff, including the production manager, there is just one more management level. The major environmental aspects of the primary process are energy consumption and emissions of volatile organic compounds (VOCs). The major health and safety aspects are injuries caused by time pressure and psychosocial issues.

2. Aims and Strategy

In 1995 the ABB group introduced aims for its environmental work. All production units should by the year 2000 have an environmental management system (EMS). However, the group soon realized that the year 2000 was too far away. There was a lot to gain by implementing the system faster and the time limit was therefore changed to 1998. ABB's intention with EMS is a combination of consideration for the environment and society and, perhaps above all, an interest in profit.

As one of the first companies in Sweden ABB Kabel was certified for ISO 14001 as well as EMAS in 1996. The company has been certified for ISO 9001 since 1991. ABB Kabel began with ISO 14001 since it dominates internationally and therefore is easier to communicate. They also made an EMAS registration as they believe that the official environmental documentation required by EMAS gives more credibility to the environmental work. Credibility is also a main reason for the external certification.

The intention with EMS was and is to have full control of how the products and processes affect the environment and, at the same time, reduce their environmental impact. This aim, to reduce environmental impact, is made up of several goals, for example:

- a list of chemicals and materials that will be substituted
- by how much the consumption of pigments will be reduced
- by how much the amount of scrap metal will be reduced
- by how much the excessive consumption of raw material will be reduced

Some of ABB Kabel's goals have been achieved, some have not. According to ABB Kabel it is important that the goals are neither set too high nor too low, they should be realistic.

ABB Kabel has worked with internal control of the working environment (IC) since 1993 when the national regulation came into effect. Before 1993 they worked with health and safety in a similar way and the regulation hardly affected their work. ABB Kabel believes that they would work in accordance with the principles of IC even if there was no regulation. Every ABB company is expected to have a good working environment as well as a quality system (QS). The aim of the IC is a safe and sound working environment. The aims are not as concrete as the aims of the EMS. At present, ABB Kabel is carrying out an inventory of working environment risks. All production units will be surveyed and, based on the results, goals will be set to reduce the risks.

IC and EMS are not linked to each other but certain parts of the IC, for example handling of chemicals, are copied into the EMS. The QS has the same structure as the EMS. It is therefore easier to link these systems, but they are not entirely integrated. When developing the EMS, routines that worked well in the QS were used, for example routines regarding deviations, corrective measures and documentation. Experiences from the QS made the EMS work much easier. ABB Kabel is of the opinion that the working environment differs from environment and quality as the working environment is an internal question in the company while environment and quality have to do with external efficiency.

3. Implementation

It took one year before the EMS was implemented in the company. When ABB Kabel began implementation, they got some help from the ABB group and during the first year they had regular contact with the group. ABB Kabel have carefully surveyed processes and products as well as suppliers in order to gather information about the total environmental impact of their products and activities. A project group composed of two people, the production manager and the safety engineer, have done most of the work in developing the EMS. Their motivation has been a personal interest in industry's responsibility for the environment. The managing director made the importance of an EMS clear to all the employees, which made the introduction easier. During the past years, the focus has changed. In the beginning it was important for the management to establish the EMS. Today they regard the EMS as one of several important tools in their work.

Different groups at the company have at different periods and to varying extents been involved in the implementation of the EMS. Since the EMS is based on constant improvement the R&D departments have played an important part in the systems introduction and development. To achieve more difficult goals, the development of new products and processes is of great importance. In order to involve all employees, they have received environmental training, both generally and for specific tasks. Now EMS is an integrated part of their work.

When it comes to IC it is harder to define when the system was implemented (there is no date of certification) and accordingly how much time it took to implement it. The actors were different. The workers' representatives were more involved in introducing IC than EMS. The commitment and cooperation of the workers was and is not as obvious. In introducing IC the company was helped by a safety engineer from the company health service, who worked as a consultant, and he also made an audit of the IC. The EMS influences the work at ABB Kabel in many ways and traces of the system are found throughout the company in routines and specifications. The external and internal audits are proofs of workable systems and the management reviews show that the system serves as a useful tool.

4. Monitoring and Control

ABB Kabel is of the opinion that the routines in both EMS and IC secure the systems. There are written allocations of work tasks that describe the responsibility of different persons. When allocating work tasks it is important to check that the knowledge and information needed is available. The routines ensure this. When monitoring whether goals have been achieved, much depends on how the goals have been defined. Quantitative goals, for example waste reduced by 30 per cent, are easier to monitor than qualitative goals. ABB Kabel believes that what has been achieved due to EMS or IC probably would have been achieved without the systems but it would have taken longer and might only have happened after an incident had occurred. At present the EMS and IC prevent incidents from happening.

An external audit of the EMS is carried out once a year, and an internal audit twice a year. Two people at the company are trained to conduct the internal audits. According to ABB Kabel the audits keep the EMS alive. Moreover, the external audits give credibility to the system. With respect to the working environment, four surveys of the working environment are carried out every year. It takes three months to make a survey of the entire company, and when the survey is completed, the safety committee has a meeting. Every two years all employees are given a form with questions on how they experience their working environment. The survey is utilized to identify the need for improvements (especially psychosocial ones).

5. Evaluation and Organizational Learning

When planning for the EMS the costs were not considered, as an EMS was considered to be a necessary investment. Today the external costs are approximately US $ 13 000 and the internal costs approximately US $ 130 000. It is not possible to make a similar estimate regarding the expenses of the IC. The introduction of the EMS has, in addition to helping identification of environmental risks, also meant new business opportunities. A new set of products has recently been put on the market. The materials are new and the product is completely free from halogen. Contacts have also been established with new customers as a result of the EMS. For example, an American company that was looking for a cable supplier with an EMS found ABB Kabel through the Internet. ABB Kabel's experience is that most of the customers do not ask for or demand an EMS, but they are very positive about it. When recruiting new employees, the applicants often ask if the company has an EMS.

6. Communication and Cooperation

ABB Kabel recognises shareholders and customers as important stakeholders. The shareholders' interest is that the company is successful. With EMS they have improved the conditions for success. The people living in the vicinity of the factory also want the company to control its environmental impact, and the EMS is used in this dialogue. ABB Kabel and some other local companies have started a network, the idea of which is to support and inspire the work for environment protection and the development of the management systems.

7. Notable Findings

ABB Kabel AB works with the voluntary environment management systems ISO 14 001 and EMAS. They also work with their working environment according to the regulations on internal control. On the whole, these systems are kept separate, with integration only concerning some parts. There is little influence from the EMS on health and safety.

Case 5. Britannia Refined Metals Ltd, Purification of Metals, Gravesend, UK

1. The Organization

Britannia Refined Metals Ltd (BRM) is based in Gravesend, Kent, on the river Thames. The company's activities are mainly to refine and purify lead and silver with zinc and copper by-products from bullion which is imported from Australia (Mount ISA) and European smelters. The main output is 99.99 % lead and 99.97 % pure silver. BRM also produces more than 150 different lead alloys. The refined lead is used in batteries, cables, petrol, pigments, pure glass, radiation shields, etc. Nearly half the output is sold in the UK and the balance is exported primarily to western Europe.

BRM has 300 employees directly involved in the production process and 100 support staff (administrative, security, sales and management). It is a small to medium-sized enterprise (SME) using the UK and European Commission definitions. BRM is an affiliate of MIM Holdings of Australia but is fully autonomous from MIM in products, management and finance. BRM was founded in 1933.

BRM has a three layer hierarchical layout structure, quality assurance having direct access to the general manager. Quality assurance of safety, health and environment belongs to the Quality Assurance department, the environmental unit is part of Technical Development, the Health and Safety unit is related to the Personnel department. The three departments, QA of SHE, Environmental unit and the Health and Safety unit, cooperate closely.

Production is a continuous process, 24 hours a day, seven days a week, with most operatives working 12 hour shifts (average 42 hours per week). BRM has a clear SHE philosophy, in that the chief executive always begins his annual address by focusing on SHE indicators. The company recognizes the risks from metals at point of entry into the workplace during smelting – risks to people (lead in blood), sulphuric discharge into the atmosphere and arsenic deposits into the river Thames – and has accordingly developed a stringent SHE system closely monitored by the UK authorities.

2. Aims and Strategy

BRM's SHE objectives are to 'minimize lost time accidents', encourage integration of safety, health and the environment, develop a SHE culture as well as 'continuous improvements by all'. A Safety and Environmental Policy exists. The development sets qualitative targets (reducing emissions and risk to 'as low as is reasonably practical') and quantitative targets (it sets precise accident and blood lead level targets, for example, 40 micrograms/ deci-litre of lead in blood, for instance, which is a lower specification than that in the legislation and guidance).

The company is due to achieve ISO 14001 status in 1998. BRM has also embarked on BS 8800 (integrating 14001 and HS(G)65 safety standards in UK). The British Standard Institute (BSI)

actively maintains and assesses BRM. BRM sees legal, managerial and insurance benefits from ISO 14001/BS 8800. The ISO route was chosen because of its international nature.

BRM has an overt commitment to continuous improvement, demonstrated by the existence of a SHE management team consisting of management, trade unions and other staff. The company sets realistic and achievable targets on a regular quarterly basis.

BRM has four aspects to its philosophy – safety, health, environmental and quality assistance (QA).

3. Implementation

All managers meet twice a month. SHE and QA issues are discussed and brought to the attention of finance, sales and marketing personnel. BRM also has regular monthly site supervisor/departmental meetings. In addition, before the start of every production shift, a SHE briefing is given. The company also has quarterly environmental meetings.

There is a high level of SHE competence at BRM with SHE managers holding graduate qualifications (NEBOSH diploma, BSc, degrees, etc.). The company does not use SHE consultants other than for specialist tasks.

BRM sets annual targets for SHE implementation which are reviewed quarterly. Implementation of plans will take two to three years before there is complete and comprehensive integration of SHE, and QA at all levels of the hierarchy.

There is a very high level of commitment by senior management to safety. Recently (1998) a group consisting of a supervisor and two employee safety representatives went to Dallas, USA for a behavioural safety conference (at the company's expense). All departments (R&D and Marketing) take safety seriously and use it as a unique selling point. Key findings by researchers and sellers are reported back at management meetings.

The driving force is necessity – a realization that a refinery cannot survive financially if SHE is ignored. The general manager, personnel manager, production manager and technical development manager, together with six other key SHE personnel, are instrumental in the SHE developments. However, the safety representatives too have been crucial in identifying and suggesting improvements.

4. Monitoring and Control

The company has in its reception area a display which highlights safety performance and environmental emissions.

Every month a business report which summarises key SHE indices (severity, frequency rates, lost time accidents, lead in blood levels, emissions, discharges, etc.) is circulated to departments and briefed to workers.

BRM is authorised as a 'Prescribed Process A' under the Environmental Protection Act 1990 and therefore must keep environmental emissions records, carry out a BATNEEC review (best available technology not entailing excessive cost) and a BPEO (best practicable environmental option) if 'pollution' is discharged (sulphur into atmosphere and arsenic into Thames – very small traces).

Weekly statistics are posted outside tea rooms also for example pollution emission levels, complaints by residents nearby, etc.

The company is currently computerising all its SHE systems, which hitherto have been manually maintained and filed. An Intranet website on SHE is being planned. The company acknowledges that information management needs to be improved.

The company monitors:

- the usual accident ratios (severity, lost time, etc.)
- perception of risk attitudes of personnel measured by a BATS system (behavioural safety observations system). The results are publicly displayed each month. BATS also encompasses attitudes to the wider environment and changing perceptions – regarding the environment as important
- lead in blood levels (this is not only a determinant for occupational health, but also the best available indicator for minor lead emissions)
- sulphur emissions levels
- noise levels.

There is a comprehensive booklet which lists all data and monitoring, in which BRM give examples of noise levels, above average lead in blood levels etc. – all have been brought under their benchmark standard due to continuous SHE monitoring.

Auditing is a central feature for BRM. Internal audits include QA audits (semi-annual), regular systems audits, and production of environmental audits. Although the company conducts inspections daily, SHE audits have yet to be carried out. The company has adopted a so-called 'MIMsafe Audit approach' (developed by MIM Holdings in Australia) and a National Occupational Safety Audit. This is a very detailed SHE, QA and human resource approach. BRM is training nine people as MIMsafe auditors, from both management and trade unions, to foster greater cooperation. External audits are carried out by the company's insurance brokers. These encompass SHE variables, given that BRM has insurance cover for pollution.

5. Evaluation and Organizational Learning

Management reviews are reactive and proactive and link SHE with QA.

The company does not carry out a formal cost benefit analysis of accidents or environmental issues (although a BATNEEC would involve CBA). It has plans to assess the direct and indirect costs of accidents.

A SWOT analysis (strength, weaknesses, opportunities and threats) of market position is given a significant focus, this includes SHE and QA considerations.

The company has given top priority to SHE training as demonstrated by regular training for all staff (5-6 days per employee, half of which is SHE-related) per annum.

6. Communication and Cooperation

The emphasis is on 'SHE culture' – vertical and horizontal, internal and external to the company. Recently a European Parliament environmental spokesperson visited BRM and commended the company approach.

BRM has realized that SHE and QA are a vital element and this has given it a major reputation in the refining market and the London Metal Exchange. The company has a proactive SHE image amongst the local press and the community.

7. Notable Findings

BRM is focused, honest and encourages all to participate. BRM have aimed at SHE and QA more formally. The company is not complacent and seeks further improvements.

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In this publication the focus is on the interactions at company and at policy level. To illustrate the relevance of the interactions at company level, five case studies of front-runner companies in different EU countries have been included.

The report shows the need for diversity in the implementation of environmental and health and safety management. It demonstrates that in front-runner companies workers' involvement is not limited to health and safety, but can be very fruitful in the implementation of environmental management as well. It clarifies the need for organizational learning as a prerequisite for continual improvement in EHS performance.

It shows that top managers of front-runner companies clearly recognize the benefits of proactive and preventive management. The benefits may be found in increased profitability, the generation of new business opportunities, greater attractiveness on the labour market, and, of course, in cleaner, healthier and safer production processes and products.

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