In order to encourage improvements, especially in the working environment, as regards the protection of the safety and health of workers as provided for in the Treaty and successive action programmes concerning health and safety at the workplace, the aim of the Agency shall be to provide the Community bodies, the Member States and those involved in the field with the technical, scientific and economic information of use in the field of safety and health at work.

European Agency for Safety and Health at Work

http://agency.osha.eu.int

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Experiences at company level

EN EN

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A great deal of additional information on the European Union is available on the Internet.
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FOREWORD

According to Article 2 of the Council Regulation establishing a European Agency for Safety and Health at Work, 'the aim of the European Agency is to encourage improvements in the working environment by providing the Community bodies, the Member States and those involved in health and safety at work with the technical, scientific and economic information of use in the field of safety and health at work'. For the purpose of achieving the aim described in Article 2, the European Agency carries out information projects to collect and disseminate relevant information in the Member States.

Increasingly complex work processes and changes in working conditions, together with the resulting new or changing types of hazard, need a new and systematic approach to safety and health at work. Solutions are required which allow the employers to take account of safety and health principles at all operational levels and for all activities, and to convert them into appropriate measures on a routine basis. Occupational safety and health (OSH) has to be managed. The EU framework directive on safety and health at work (Directive 89/391/EEC) obliges to make operational an organisation for OSH issues and management of health and safety procedures. In this context OSH management systems can be helpful instrument.

The objective of this European Agency information project is to provide information concerning good practice examples about possible ways occupational safety and health management systems are being implemented in companies in the European Member States.

The European Agency would like to thank Helmut Hägele from ISG and all those other organisations and individuals participating in this project, especially by providing occupational safety and health management systems (OSHMSs) examples at enterprise level. Finally, the European Agency wishes to thank the Focal Points and the Thematic Network Group 'Systems and Programmes' for their comprehensive work with respect to the project.

Bilbao, April 2002
EUROPEAN AGENCY FOR SAFETY AND HEALTH AT WORK

SUMMARY

SUMMARY

The concept of occupational safety and health management systems (OSHMSs) is rather complex and several definitions are available. The current debate about OSHMSs makes clear that there is no standardised understanding of the concept of occupational health and safety management. Rather different approaches and models exist and frequently merely partial elements are regarded as complete management systems. Although the overall objective is to improve the safety and health of those working, at a more detailed level one can find a variety in focuses, for example by using prevention as an overriding company objective, by promoting the employer's responsibility or by improving the employees' participation and their representatives.

In this report a number of initiatives are described where companies have introduced or improved their OSH management system. More in particular these descriptions focus on:

- which objectives have been set,
- which specific aspects of an OSH management system are being used, and
- which experiences exist with respect to the actual implementation of the OSHMS.

The cases also provide information on the background of the initiative as well as the content.

In order to facilitate understanding of the subject, an overall framework for OSH management is first presented. This describes a management system that contains a number of processes and content variables. This ideal management system includes a number of processes and content variables. These basic processes are shown below ([1]).

Each of these processes contains a number of content variables. These are summarised in table format.

([1]) These five basic elements correspond to a large degree with the organising categories of the International Occupational Hygiene Association (IOHA) which are based on the model for OSHMS developed by the University of Michigan, USA. With regard to the used basic elements these variables are listed in section 2.6.

CATEGORISATION OF THE CONTENT VARIABLE A WITHIN THE PROCESS ELEMENTS

Initiation — OSH input	Implementation — OSH process	Evaluation — OSH feedback
Management commitment and resources	Training system	Communication system
Regulatory compliance and system conformance	Technical expertise and personnel qualifications	Document and record management system
Accountability, responsibility and authority	Hazard control system	Evaluation system
Employee participation	Process design	Auditing and self-inspection
	Emergency preparedness and response system	Incident investigation and root-cause analysis
	Hazardous agent management system	Health/medical programme and surveillance
	Preventive and corrective action system	
	Procurement and contracting	
Formulation — OSH process	**Effects — OSH output**	**Improvement/integration — open system elements**
Occupational safety and health policy	OSH goals and objectives	Continual improvement
Goals and objectives	Illness and injury rates	Integration
Performance measures	Workforce health	Management review
System planning and development	Changes in efficiency	
Baseline evaluation and hazard/risk assessment	Overall organisation performance	
OSHMS manual and procedures		

In Chapter 3 a number of initiatives are described where companies aimed at implementing or improving their OSH management systems. These include:

- Agfa-Gevaert NV, Mortsel
- Adargo Press AB, Hisings Backa
- The home care unit in the municipality Herlev
- Mitteldeutsche Braunkohlengesellschaft (MIBRAG), Theißen
- Building highways in Greece, the Attiki Odos consortium
- University College of Cork, Cork
- Manufacturing of hearing devices by Amplifon, Milano
- Sermelux S.A., Kehlen
- Producing tiles, pavements and ceramics by Ballesmar, Onda
- OSH and total quality management in Berglandmilch company, Graz
- Leyland trucks, Leyland

In many cases the need for further development of the existing occupational safety and health organisation was the reason for the implementation of an OSHMS. Therefore, most of the OSHMSs are based on former (partial) systems. For example, the German mining company MIBRAG modified its occupational safety programme by taking over components of the system used by their Anglo-American owners. The Greek street-building consortium Attiki Odos introduced a completely new occupational safety and health management system due to the national decree, which transposed the EU directive on safety and health on construction sites (92/57/EEC) into national law. The implementation of an OSH system in the Austrian Berglandmilch company was initiated by an increase in the number of accidents at work.

IMPLEMENTATION AND REALISATION

All producing companies chose forms of organisation, which were directly connected to other management functions, e.g. Agfa related their OSHMS to ISO 9002. This example from Luxembourg showed that a very detailed OSHMS is part of the company's philosophy, which depicts exactly how work shall relate to health and aesthetic aspects. For the German mining company MIBRAG occupational safety is the company's objective number one and has the same priority/level as other company goals.

For the implementation of the OSHMS the employees were usually consulted and involved in different ways. Very few examples show the consultation of external specialists for the development of OSHMS. In fact, only Sermelux (Luxembourg) used two external experts.

The examples also underline the fact that the integration of an OSHMS into existing management systems is a difficult process which takes a long time to be finalised.

EFFECTS OF THE OSHMS

Quantifiable objectives relating to the introduction of an OSHMS could only be observed in a few cases. Companies that defined such objectives mostly referred to the 'zero accidents' strategy. A reduction of accidents at work was achieved by those companies that had defined quantitative targets; e.g. the German mining company MIBRAG, Agfa in Belgium and the Berglandmilch company in Austria. Another effect is the increase of employees' motivation. Even though this was not measured in a quantitative way, many companies believe that productivity rises with the implementation of the OSHMS.

STRENGTHS AND WEAKNESSES

The concepts focus mainly on the prevention of accidents at work, while aspects of occupational diseases and work-related ill health had less attention. The importance of OSH in the companies has different levels, e.g. in the Greek street building company Attiki Odos or for the University of Cork, OSH is treated as a necessary measure. In the Luxembourg or in the Italian and German companies, OSH is seen as one of the most important elements of their philosophy. Regarding the achievements and successes, the enterprises' examples emphasise the necessity to declare occupational safety and health as an executive duty.

In general, the advantages of a strong OSHMS prevail in all the companies included in the report. Above all, the bigger companies reduced their numbers of work accidents and by that the working time lost. Further, OSHMSs strengthened the employees' motivation, e.g. by giving them additional competencies. Besides that OSHMSs increased the employees' identification with their company.

Weaknesses became visible wherever a necessary skill of communication or the competence of the persons involved could not be guaranteed. This happened especially in those cases where the integration of the employees was on a voluntary basis. Here, a lack of participation can be the consequent result. High costs (especially in the beginning) are another detrimental factor. In general, the enterprises' examples support the thesis that innovative management strategies are superior to those with a purely traditional background. The main advantages are that they encourage:

- systematic root analysis of hazards, risks and incidents;
- strong awareness of hazards and risks;
- improved transparency concerning internal processes;
- better communication among employees;
- stronger motivation and identification of employees with their company;
- a more extensive and integrated point of view in the sense of the working environment;
- better measuring of the occupational safety and health performance.

The implementation of such a system is always accompanied by considerable expenditure for the company, the qualification of the employees being a necessary factor. Even so, the examples hint at the fact that the initiation and the implementation of an OSHMS have to be planned carefully and that the companies' specific conditions have to be considered. This is an important condition for a successful implementation.

1.

INTRODUCTION

The concept of an OSH management system (OSHMS) is rather complex. Several definitions are available. The current debate about OSH management systems makes clear that there is no standardised understanding of the concept of occupational health and safety management and different approaches and models exist. It is often the case that merely partial elements are regarded as complete management systems. Although the general overall objective is to improve safety and health of the employees, one can find at a more detailed level a variety of angles. For example:

- *Prevention as an overriding company objective*

The incorporation of occupational safety and health as an overriding company objective is a basic prerequisite for a successful occupational safety and health management system. The criterion of the 'overriding company objective' will thus be interpreted that safety and health are of equal ranking compared to other company objectives. It is important to know at which level and consequently how the issue of occupational health and safety will sit as an overall objective alongside other chosen objectives, such as the improvement of competitiveness, the reach and development of a market position or top-quality production, in order to determine whether the material attaches a high or medium focus to these objectives. The enterprise has to determine occupational safety and health measures and that these have to be observed in all organisational activities.

- *Promotion of the employer's responsibility*

The responsibility of the employer for occupational safety and health of those employed is a central element in the concepts of occupational safety and health.

- *Improvement of the employees' participation and their representatives*

One central issue is the participation of the employee, irrespective of whether they participate at the individual level/individual case or at the level of collective representation.

- *Raising the motivation of the top management and employees*

The motivation of top management is closely related to the promotion of the employer's responsibility. The top management of an enterprise is the key player for a comprehensive corporate policy in the field of occupational safety and health. Since this group of persons is usually occupied with their management duties, they have only few resources for other issues such as occupational safety and health. An OSHMS may increase and maintain the motivation of top management concerning issues of occupational safety and health.

- *Improvement of the quality of the products and the services and the environmental conditions at enterprise level*

The quality of products and services and the environmental conditions within the enterprise can be related to the introduction of an OSHMS. Internal control issues can play an important role regarding these two aspects.

- *Reduction of operational costs*

The objective to reduce the costs is not that which is mentioned most frequently. However, the reduction of accidents at work and the decrease of work-related ill-health can be seen as a priority. Effective health and safety policies can clearly contribute to cost-reduction strategies. Most important are questions about the costs arising for the employer in the event of an accident.

One can also consider keeping the additional resources that are required for the introduction of an OSHMS, if possible, at a low level and, if it can be achieved without friction, integrate an OSHMS into the operational processes.

- *Creation and use of synergies in relation to other management systems*

Usually enterprises or organisation already have some kind of management system. If an OSHMS is introduced, then links to other systems have to be taken into account If possible, synergies must be used. In many cases this will involve the ISO standards 9000 ff. and 14000 ff as well as the European Environmental Management and Audit Scheme (EMAS).

- *Increasing transparency in the enterprise and towards external organisations and/or persons*

Increasing transparency is also emphasised as an objective. This is often in order to improve relations with national/regional authorities.

Aim of the report

A number of initiatives are described in this report where companies have introduced or improved their OSH management system. In particular these descriptions focus on:

- which objectives have been set,
- which specific aspects of an OSH management system are being used, and
- which experiences exist with respect to the actual implementation.

The cases also provide information on the background of the initiative as well as the content.

In order to facilitate a systematic understanding of the subject, an overall framework for OSH is presented in Chapter 2. It describes a management system which contains a number of processes and content variables. In Chapter 3 a number of initiatives are described where companies have intended to implement OSH management systems.

2.

ELEMENTS OF AN IDEAL OSH MANAGEMENT SYSTEM: THE REFERENCE MODEL

An ideal management system should include a number of processes and content variables. These basic processes are shown below ([2]). Each of these processes contains a number of content variables. These are highlighted in the following paragraphs.

([2]) These five basic elements correspond to a large degree with the organising categories of the International Occupational Hygiene Association (IOHA) which are based on the model for OSHMS developed by the University of Michigan, USA. With regard to the utilised basic elements these variables are listed in section 2.6.

2.1 OSH INPUT — INITIATION

The OSH input factor includes the following four content variables:

1. Management commitment and resources:

- senior management representative(s) responsible for overseeing the proper functioning of an OSHMS;
- allocation of sufficient resources for the proper functioning of an OSH programme or management system;
- establishment of organisational structures that support managers and employees in their OSH duties.

2. Regulatory compliance and system conformance

Compliance with legal provisions and their conformance with the OSHMS is of high priority.

3. Accountability, responsibility and authority

The accountability, the responsibility and the authority are important elements which must be clarified in each enterprise.

4. Employee participation

This should take place either:

- directly through the individual cooperation on issues of occupational health and safety, participation in circles, working groups, etc.; or
- indirectly through their representatives, e.g. safety representatives elected by the employees. This also includes bodies such as occupational safety and health committees in which employees are represented.

2.2 OSH PROCESS — FORMULATION AND IMPLEMENTATION

Formulation

The basic category OSH process is rather comprehensive, and within it a number of variables can be identified. It includes the formulation of an OSH policy for the enterprise including instructions for dealing with the suppliers and cooperation partners. The variables include:

1. Occupational health and safety policy/goals and objectives

A well-formulated OSH policy forms the basis for the objectives in the field of occupational safety and health, the measures to be taken and the relationship these measures have to other company objectives. The policy should be short and precise, be published by the top management and made known to all employees.

2. Performance measures

The ability to measure performance, and as a precondition for this the development of measurable indicators that can be derived from the goals and objectives, is regularly discussed. The necessity to make such measurements is highlighted. Diverse problems arise from this. Some approaches and hints at best practice and solutions are highlighted in section 2.3 on OSH output.

3. System planning and development

This covers the explanations relating to the development of, and in particular the modifications to, the OSHMS. Most of the material deals with these issues in detail and the further development of OSHMS is often a central topic.

4. Baseline evaluation and hazard assessment

To conduct a baseline evaluation and a hazard/risk assessment is a prerequisite to the introduction of an OSHMS. It is necessary to identify the existing practices as well as the hazards and risks in order to be able to develop an OSHMS for the organisation that adequately meets its specific requirements. OSHMS concepts as a rule deal with the topics of baseline evaluation and hazard assessment.

5. OSHMS manual and procedures

Usually little importance is given to a manual. However, more specific documents will frequently need to be drafted in order to set out individual procedures.

Implementation

These basic elements are:

Training system (in particular technical expertise and personnel qualifications)

Hazard control system (process design, emergency planning and response system, and hazardous agent management system)

The hazard control system is broadly defined and includes the various methods used to reduce or eliminate occupational hazards as well as methods through which the control system should be modified in the case workplace conditions change. This includes the installation of new processes or operations, emergency planning and the management of hazardous agents.

Emergency planning and the handling of hazardous agents are central issues in all OSHMS concepts. The explanations concerning these issues are very detailed and the impression could arise that the OSHMS has the task of ensuring the functioning of emergency measures and the handling of hazardous agents.

In comparison to the issues of emergency preparedness and the handling of hazardous agents, the aspect of process design that includes the introduction of new operations, the modification of manufacturing processes, etc., is almost neglected in some approaches.

Preventive and corrective action system

This system element refers to actions taken in response to, or in anticipation of, system breakdowns or high hazard/risk events. Central to an effective system is the decision as to which actions should be as regarded as likely. Safe working procedures and practices are key elements of this system.

Procurement and contracting

The purchase of products is an issue considered frequently in OSH management systems. Occupational safety and health aspects should be considered as early on as at the time of purchase. This should be guaranteed by taking the relevant organisational precautions, e.g. information about the effects of certain products on health, or the involvement of safety experts in the purchase.

Contractors are to be understood as external organisations or individual persons having a contractual relationship with the enterprise or the organisation, e.g. in working groups, as external companies, etc. ([3]). Cooperation with contractors is regulated in a different way. Cooperation on worksites is one of the most essential requirements in the field of occupational safety and health.

2.3 OSH OUTPUT AND FEEDBACK

The element 'OSH output' plays an important role. In particular, the description of the measuring and assessment of the output and the development of operational criteria to measure performance have to be sufficiently concrete that they can be applied in practice by those responsible at enterprise level. However, the output variables, their operational implementation and the way of measuring can differ considerably.

1. OSH goals and objectives

There is often a strong focus on the achievement of the formulated OSH objectives.

2. Illness and injury rates

Illness and injury rates are features that are pointed out in many OSHMS concepts. There is no marked difference in relation to the significance of these indicators. One could also consider a form of 'benchmarking' with other enterprises related to these rates.

([3]) The European Agency published a report with 22 case examples on occupational safety and health in marketing and procurement (see http://agency.osha.eu.int/publications/reports/marketing).

3. Workforce health

General health and the well-being of the employed, unless expressed as 'illness rate', is used on a considerably lesser scale.

4. Changes in efficiency

The improvement of the enterprises' efficiency is sometimes a subject of an OSHMS concept. Direct increases of efficiency, expressed by higher productivity or indicators indirectly referring to improvements, e.g. increased motivation of the workforce, are however regarded as an exception.

5. Overall performance of the organisation

The overall performance of the enterprise is only exceptionally or indirectly addressed.

2.4 OSH FEEDBACK

1. and 2. The communication system including the document and record management system

Regardless of the communication channels (verbal, written or electronic) communication is of central importance. Communication tasks include the drafting, dissemination, updating and checking of documents.

3-6. The evaluation system with its elements of auditing and self-inspection, the incident investigation and the 'root-cause analysis' as well as the health/medical programme and surveillance

The second aspect of the OSH feedback consists of the evaluation system including the sub-issues of 'auditing and self-inspection', 'incident investigation and root-cause analysis' as well as 'health/medical programme and surveillance'. In general, the evaluation and the two aspects of 'auditing and self-inspection' and 'incident investigation and root-cause analysis' are considered to be important. The aspect of 'health/medical programme and surveillance' is sometimes considered in relation to preventive check-ups of industrial medicine. Health promotion at the enterprise level that goes beyond the workplace is not practised.

2.5 OPEN SYSTEM ELEMENTS

The open system elements in the OSHMS are responsible for the continual improvement of occupational safety and health, for regular overall management reviews and the integration of occupational safety and health tasks and activities into other management systems and into the business processes.

1. Continuous improvement

The continual improvement of occupational safety and health is a standard topic. In connection with the evaluation outcome measures are usually demanded in order to encourage further development/improvement of the organisation, if necessary introducing new processes by which to achieve this. Motives for the introduction of a process of improvement are the results of the regularly-occurring system evaluations, current incidents (such as accidents at work), modifications of the work organisation, and changes in the production process, etc.

2. Management review

Management reviews evaluate the overall performance of the OSHMS. In this context the OSHMS is analysed in relation to the overall organisation and to the environment or third parties. This also involves assessing the OSHMSs' ability to correspond to the needs and requirements of the employers, the employees and the inspection. The system audit assesses the performance of the OSHMS, its structure and the results achieved. The compliance audit reviews the compliance of public and legal obligations in the field of occupational safety and health.

The variable of management review is often dealt with in connection with continual improvement or the evaluation. The evaluation process and the procedure of continual improvement are in these cases more concise, more differentiated and in full detail.

3. Integration

Integration refers to those actions and measures taken by the organisation in order to link occupational safety and health and the OSHMS to other management systems or even to integrate them. Successful integration could mean, for example, that the OSHMS becomes part of the organisational culture. In this way, the occupational safety and health objectives become business objectives and the management has thereby included aspects of occupational safety and health in daily work routines.

In 1998 the Institution of Occupational Safety and Health (IOSH) ([4]) published a paper on the integration of a management systems for OSH, environmental protection and quality. The major findings are presented in the box below:

([4]) United Kingdom.

Prerequisites	Process
The organisation should have:	The organisation should decide:
– reviewed the overall business case for an integrated management system;	– on the choice of an overall integrated management system model. Many organisations may have developed quality systems that follow too slavishly the sequences of topics given in that standard;
– reviewed the adequacy of existing arrangements and future needs of each management system;	– how to retain the integrity of existing systems while the new system is developed;
– identified the key elements of each system that must be retained and the appropriate level of detail applicable to each;	– whether piloting parts of the integrated system is necessary;
– decided on the phasing and extent of integration;	– on a phased plan showing the milestones to an integrated system, and the individual responsibilities;
– consulted widely throughout the organisation;	– on appropriate arrangements for training needs analysis and training;
– obtained the enthusiastic support of top management for the integrated system;	– on the introduction of a continuing programme to retain the commitment of members of staff.
– studied the recommendations of any industry-specific standards, and considered the need to take external advice as appropriate;	
– decided on the measurable criteria that would be used to monitor and assess the effectiveness.	

In most approaches the integration with other parts of management systems is a central theme and many documents contain concrete indications and tools, such as checklists, in order to show the links to other systems and to facilitate integration. In general it can be pointed out that the ISO standards covered within the series 9000 and 14000 are mentioned most frequently. Some of the material follows the structure of ISO standards, so that the users can make better use of the material. The European Environmental Management and Audit Scheme (EMAS) is also mentioned on several occasions.

There are three degrees of integration:

- no integration if the partial systems have only a few or no links (additional type);
- various links and common elements, e.g. a common handbook for occupational safety and health and environmental protection — this system may be a semi-integrated type;
- fully-integrated systems.

In practice there is often a certain degree of integration. The possibilities for integration may well be in particular in the field of quality assurance and environmental protection at the company level.

2.6 THE REFERENCE MODEL

In the figure below the five process elements of an ideal OSH management system are presented. It should be understood in a broad sense and as a combination of the managerial and organisational arrangements, including planning, review and open system elements, the consultative arrangements and programme elements, that are combined to improve occupational safety and health.

Five basic elements have to be included in order to describe an occupational safety and health management system (see Table 1) (on the basis of the maximal list for occupational safety and health management systems ([5])). The reference model includes the idea of continuous improvement (plan, do, check, act).

Table 1: OSHMS categories and variables summarised

Initiation — OSH input	Implementation — OSH process	Evaluation — OSH feedback
Management commitment and resources	Training system	Communication system
Regulatory compliance and system conformance	Technical expertise and personnel qualifications	Document and record management system
Accountability, responsibility and authority	Hazard control system	Evaluation system
Employee participation	Process design	Auditing and self-inspection
	Emergency preparedness and response system	Incident investigation and root-cause analysis
	Hazardous agent management system	Health/medical programme and surveillance
	Preventive and corrective action system	
	Procurement and contracting	
Formulation — OSH process	**Effects — OSH output**	**Improvement/integration — open system elements**
Occupational safety and health policy	OSH goals and objectives	Continual improvement
Goals and objectives	Illness and injury rates	Integration
Performance measures	Workforce health	Management review
System planning and development	Changes in efficiency	
Baseline evaluation and hazard/risk assessment	Overall organisation performance	
OSHMS manual and procedures		

Source: The International Occupational Hygiene Association (IOHA): 'Occupational Health and Safety Management Systems – Review and Analysis of International, National, and Regional Systems and Proposals for a New International Document', Report to ILO, 1998.

([5]) The International Occupational Hygiene Association (IOHA): 'Occupational Health and Safety Management Systems – Review and Analysis of International, National, and Regional Systems and Proposals for a New International Document', Report to ILO, 1998.

2.7 CATEGORIES IN OSH MANAGEMENT

OSH management systems can also be categorised according two dimensions ([6]):

- traditional vs innovative management,
- safe workplace orientated strategy vs safe person-control strategy.

Dimension I Traditional management vs innovative management

Traditional management

Health and safety is integrated into the supervisor's role and the 'key persons' are the supervisor and/or any health and safety specialists; employees may be involved, but their involvement is not viewed as critical for the operation of the health and safety management system, or alternatively a traditional health and safety committee is in place; the emphasis is either on people management (safe person) or on technical/programme/legislative mechanisms to identify and mitigate hazards (safe place).

Innovative management

Management has a key role in the health and safety effort; there is a high level of integration of health and safety into broader management systems and practices; employee involvement is viewed as critical to system operation and there are mechanisms in place to give effect to a high level of involvement.

Dimension II Safe workplace orientated strategy vs safe person control strategy

Safe workplace-oriented strategy: prevention strategy focused on the control of hazards at source through attention at the design stage and application of hazard identification, assessment and control principles.

Safe person control strategy: prevention strategy focused on the control of employee behaviour.

Types of OSH management systems

Category 1	**Category 2**
Innovative/safe person	Innovative/safe place
'Sophisticated behavioural'	'Adaptive hazard managers'
Category 3	**Category 4**
Traditional/safe person	Traditional/safe place
'Unsafe act minimisers'	'Traditional engineering and design'

([6]) Based on Gallagher, C: Health and Safety Management Systems: An Analysis of System Types and Effectiveness, 1997.

Four categories of OSHMS result from the combination of the two OSH management systems dimensions.

Category 1. Sophisticated behavioural

Prevention activity upstream and employee related; high level of employee involvement in an environment where employee behaviour is linked to accident causation, and where a 'no-blame' philosophy prevails; a higher level of integration or alignment regarding health and safety with broader management systems.

Category 2. Adaptive hazard managers

Prevention activity centred on the control of hazards at source in accordance with the identification, assessment and control framework; a problem-solving focus to employee involvement is directed to the management of key workplace hazards; and a higher level of integration, or alignment, of health and safety with broader management systems.

Category 3. Unsafe act minimisers

Emphasis on unsafe acts; emphasis on supervision of employee behaviour; and rules to prevent employee risk taking.

Category 4. Traditional design and engineering

Prevention activity centred on the control of hazards at source in accordance with the 'identify, assess and control' framework; employees may be involved but they are not central to the operation of the health and safety management system, or alternatively a traditional health and safety committee is in place; supervisors, line managers and health and safety specialists have the key roles.

3.

THE CASES

In this chapter, eleven case studies are presented where OSH management systems have been implemented or improved in companies in different ways. In each of the descriptions an overview has been added which shows which elements of an ideal OSH management system as presented in Chapter 2 are actually used or dominant. This overview serves to highlight the most interesting elements and does not enumerate all the factors at work in the organisations.

3.1 AGFA GEVAERT N.V., MORTSEL ([7])

- Semi–integrated management system
- ARBO groups
- High employee involvement
- Low accident rate

Background

Agfa-Gevaert N.V. in Mortsel (Belgium) is the headquarters of the Agfa-Gevaert Group and employs about 5 590 people. In spite of its well-known products within the photographic and film industry, Agfa-Gevaert's main business consists in the creation of innovative solutions for the graphic and photographic industries and the medical imaging market. Agfa-Gevaert Products are on the market in about 150 countries. The company has structured its activities around five business groups:

- consumer imaging,
- graphic systems,
- medical imaging,
- non-destructive testing, and
- industrial imaging.

The company's main suppliers are from the metal, packaging materials and chemical industries. The enterprise itself supplies only finished products.

One important issue concerning hazards and risks at work is that there are many different chemical products on the work floor. The two main problems are that employees must be able to read a chemical card in order to understand the chemical codes, and the rate of industrial accidents, which, according to the safety manager, is still too high.

Facts

For a long time, Agfa-Gevaert had a prevention policy that aimed at improving/maintaining the safety and health of their staff. The subject is now coordinated in one of Agfa's supporting services: the 'Coordination cell for quality, occupational health and safety and environmental management systems'.

The basis for Agfa's OSHMS is the Belgian labour regulations that require a dynamic risk control system. Further, Agfa-Gevaert has the ISO 14001 at its disposal and lives up to standards according to the 'Responsible Care code' as set out by the Union for the Chemical industry.

([7]) Case study undertaken by Prof. Dr Johan van de Kerckhove, HIVA-Vorming, Pellenberg, December 2000.

The enterprise's OSHMS is part of a global management system, which is based on the principles of ISO 9001 and also includes environmental and quality topics. Its main OSH-related goal is the achievement of a zero rate of industrial accidents. In the beginning, the OSHMS was initialised by the 'Prevention and Protection committee', which consists of employees' and employers' representatives. After this, each department started to formulate points of focus in the effort to realise a safer and healthier environment. Ever since, the level of employee participation has been as high as possible. A special step and method was the foundation of 'ARBO groups' which stand for attention towards safety and health, reaction to unfavourable conditions, assessment of risks, and encouraging a positive attitude towards OSH and the environment. ARBO groups meet six times a year in order to discuss industrial accidents, unsafe situations, new actions, etc. There are also ARBO mini-groups, which allow for the participation of every single employee. This network of ARBO groups constitutes the basis for communication — both from the top to the bottom and from the bottom to the top.

Moreover, an annual action plan sets objectives focused on a specific theme. There is a relatively high involvement of employees and the different ARBO groups are very well integrated into the company's management system. There is a steering group that determines the annual action plan and a committee that must give its final consent. Afterwards the annual action plan is passed on to the other group leaders who have to discuss this topic in their group.

Every year the safety manager visits every single department in order to assess the development of OSH subjects. Together with a representative of the committee and the head of the department, he writes an evaluation report, which is then returned to the department. Afterwards, the department develops a plan for further action, taking into account both the investigation report and their own ideas. This plan has to be reported to the committee together with actions that have been carried out and problems that have been encountered.

Agfa-Gevaert has developed two types of training for their workers:

- an OSH package including videos, newspapers, guidelines, posters and other easily-understandable tools which raise the awareness of the employees with respect to OSH;
- a specific training for everybody who changes or starts a job and thus has to deal with new procedures and machines.

At Agfa-Gevaert constant improvement is stimulated by a permanent reflection on work situations and on instructions by the communication network of the ARBO groups. Internal and external audits are also carried out.

Assessment

The OSHMS of Agfa-Gevaert is a semi-integrated system with several links and common elements. However, it has not yet reached the target of a fully-integrated management system.

The effects of introducing an OSHMS have been successful. Several advantages have become obvious. Agfa-Gevaert has succeeded in establishing numerous 'mini ARBO groups', thereby involving large numbers of people in the project and motivation among staff seems to be

high. Even though Agfa-Gevaert lies much below the average rate of occupational accidents, they still aim at increasing the safety levels and perceive their current results as too weak.

Other advantages are those of an integrated system: it is much more transparent than a number of separate management systems and it requires only one single audit. It is possible to take advantage of the existing written procedures of every work process.

Although the theoretical concept of the OSHMS is well planned and developed, some differences remain in its implementation. Not all ARBO groups and employees live up to the standards that were established, or they regard only one or two of these points as being their focus and responsibility. Another disadvantage is the complicated code of the chemical card. For this reason Agfa-Gevaert has already planned a new and much easier system.

Problems and prevention measures are formulated on the basis of the action lists. Consequently, carrying out risk analyses is, for Agfa-Gevaert, not the only source from which to formulate prevention measures. Because an action list is already being used, risk analysis is often considered redundant.

The management seems to be aware of some weaknesses and is attempting to further develop the current OSHMS. All in all it seems that Agfa-Gevaert uses an OSHMS which has standards higher than those set out under Belgian law.

Initiation — OSH input	**Implementation — OSH process**	**Evaluation — OSH feedback**
Management commitment and resources	✓ Training system	Communication system
Regulatory compliance and system conformance	Technical expertise and personnel qualifications	✓ Document and record management system
Accountability, responsibility and authority	Hazard control system	Evaluation system
✓ Employee participation	Process design	Auditing and self-inspection
	Emergency preparedness and response system	Incident investigation and root-cause analysis
	Hazardous agent management system	Health/medical programme and surveillance
	Preventive and corrective action system	
	Procurement and contracting	
Formulation — OSH process	**Effects — OSH output**	**Improvement/integration — open system elements**
✓ Occupational safety and health policy	OSH goals and objectives	Continual improvement
Goals and objectives	✓ Illness and injury rates	✓ Integration
Performance measures	Workforce health	Management review
System planning and development	Changes in efficiency	
Baseline evaluation and hazard/risk assessment	Overall organisation performance	
OSHMS manual and procedures		

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3.2 ADARGO PRESS A.B., HISINGS BACKA ([8])

- Traditional management with innovative elements
- Swedish compulsory regulation as a basis
- Yearly action plan
- Integration OSHMS with quality system

Background

Adargo Press A.B. was founded in 1995 and based on the former printing house Aftonbladet Civil A.B.. It represents a modern printing house with effective up-to-date technology. In total, 63 employees work on the printing of three daily newspapers, advertisement material and other civil printing. The management group of Adargo Press A.B. consists of its main owner, a personnel manager who also serves as technical manager, the financial manager and — in a supporting function — an environmental officer.

The whole enterprise is divided into five different departments (Management, Marketing, Pre-Press, Printing Works and Distribution) of which the Printing Works department is the biggest. Overall, 32 people work shifts here 24 hours a day. They are divided into four teams, each of which has their own team-leader. Within a normal newspaper production process up to 30–38 000 copies an hour are produced and then transferred to the distribution department. Here the papers are bundled and prepared for a proper delivery to their customers and newsvendors.

The main hazards in the company are injury caused by crushing in the printing press or on the transport tracks, personal injury from collision with trucks, and disorders caused by manual handling of heavy goods. Shift work also contributes to the risk of congenital heart disease and diseases of the digestive system. Additional risks consist of stress-related problems. This relates to the demands of new technology, especially when applied on a work force with a relatively high average age and old professional education.

The Adargo Press OSHMS is based on the Swedish compulsory regulation 'Internal control of the work environment AFS 1996:6', first brought into force in January 1993. The possible profits of an OSHMS combined with the abovementioned regulation convinced Adargo's predecessor Aftonbladet Civil A.B. of its implementation. A group consisting of two foremen, the principal safety representative and an external adviser, started the OSHMS implementation. A safety committee of employers and employees watched the process. Adargo itself has continued and updated this system on a regular basis.

([8]) Case study undertaken by Mats Karling, IVF, Mölndal, December 2000.

Facts

The enterprise's declared goals are a safe working environment, ergonomic workplaces and to have a low impact on the external environment. All steps towards this goal shall be developed together by management and employees. A yearly action plan demonstrates needs, benefits and improvements of the OSHMS development, while a concise documentation plan depicts:

- the company's policy,
- steps towards improvement for the work environment,
- organisation plan,
- regulations,
- work environment inspections,
- training plans,
- handling of work-related illnesses and accidents at work, and
- ongoing review of the OSHMS.

The managing director, economic director, associated PM, foremen and union representatives are responsible for the training and introduction of new staff.

Many advantages have risen from the implementation of the OSHMS. Adargo depicts it as a 'backbone' to support effective work. It is an instrument of practical measures, including a well-structured agenda and a checklist for meetings and inspections.

Within the implementation of the OSHMS, responsibilities have been allocated and governmental regulations filed together. These two aspects have led to a new, well-structured and clear overview and improved organisation of tasks and requirements.

The review of the system shall be a current issue on the agenda of the safety committee's meetings.

In future it is planned to integrate the OSHMS with the recently-adopted quality system referring to ISO 9000.

Assessment

The Adargo OSHMS combines traditional management with new and innovative elements.

After an initial campaign, aiming at the OSHMS's announcement and introduction, the system was well accepted. This is based on the inclusion of staff from all departments and levels of the company. The OSHMS supports structure and organisation, systematic improvement and the use of factual measures. Weaknesses can be found in the possibility of an upcoming routine. This could lead to a certain loss of continuity in the documentation and a lack of updated information. Everybody, even those new in the company, should be able to set up their knowledge on the process quickly and easily. Adargo Press offers no regular education or training.

The system is on one hand based on a conventional role allocation and on the other demonstrates a modern integration and collaboration of personnel at all levels. The belief in the profits of health and productivity, arising from a good working environment, is the general prerequisite. Adargo even participates in experimental measures such as financing golf classes for their staff. It is hoped that this will help prevent their shift-working employees from feelings of isolation during their sometimes antisocial spare time, as well as avoiding the danger of alcoholism.

Areas of possible improvement lie in the documentation and measurement methods. The documentation should be administrated more thoroughly in order to stay up-to-date with possible improvements. As far as concerns measurement methods, new and more meaningful ways of measuring the OSHMS's effects should be found. The problem with documentation will probably be solved by integration with ISO 9000, but the difficulty of measuring effects of the OSHMS will still demand further work.

Both steps would give the chance for a more innovative and proactive OSHMS. Successes and disadvantages could be identified faster and reviews would be easier.

Thus the concluding recommendation can be summed up as follows:

- Appoint a responsible person to care for and develop the OSHMS
- Review the system
- Update documents and routines
- Integrate the OSHMS with other systems if needed
- Educate all personnel
- Implement the revised proactive system

Initiation — OSH input	Implementation — OSH process	Evaluation — OSH feedback
Management commitment and resources	Training system	Communication system
Regulatory compliance and system conformance	Technical expertise and personnel qualifications	Document and record management system
Accountability, responsibility and authority	Hazard control system	Evaluation system
✓ Employee participation	Process design	Auditing and self-inspection
	Emergency preparedness and response system	Incident investigation and root-cause analysis
	Hazardous agent management system	Health/medical programme and surveillance
	Preventive and corrective action system	
	Procurement and contracting	
Formulation — OSH process	**Effects — OSH output**	**Improvement/integration — open system elements**
Occupational safety and health policy	OSH goals and objectives	✓ Continual improvement
Goals and objectives	Illness and injury rates	Integration
✓ Performance measures	Workforce health	Management review
System planning and development	Changes in efficiency	
Baseline evaluation and hazard/risk assessment	Overall organisation performance	
OSHMS manual and procedures		

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3.3 THE HOME CARE UNIT IN THE MUNICIPALITY OF HERLEV, HERLEV ([9])

- High degree of employee involvement
- Innovative
- Mix between behavioural sophisticated approach and an adaptive hazard management approach

Background

Like all the other 274 municipalities in Denmark, the Municipality of Herlev is responsible for carrying out a large proportion of the tasks involved in the Danish social welfare system. One of these tasks is to provide home care for elderly, disabled people and others (primarily people suffering from mental illnesses) in need of home care. In the Municipality of Herlev approximately 1 000 clients receive home care. The responsibility for providing home care rests with the Home Care Unit, which employs about 200 home care assistants.

The main hazards for the home care assistants are back and shoulder pains caused by the physical requirements of the job, which involves, for example, vacuum cleaning, carrying heavy shopping bags and lifting of people. Another obstacle is connected to the fact that private homes are rarely designed with care-taking activities in view. This makes it difficult to use lifting and moving aids in the home, and makes cleaning difficult. Many of the problems are related to a poor working environment, caused by a high workload added to the pressure of having to deal with angry clients. In 1992 a working group consisting of area managers and safety representatives began implementing the OSHMS. In 1994, all home care units, retirement homes and day-care centres became legally obliged to register with the Occupational Health Service in Denmark, an institution founded under the Ministry of Labour, which provides advice on occupational health and safety issues, as well as training and educational schemes. The Occupational Health Service in Denmark has been a major contributor to the development of the current OSHMS in the Home Care Unit in Herlev. In addition, since 1997 all enterprises have been legally required to make a written workplace assessment.

Facts

The Home Care Unit has two goals in particular:

- to have a safe work place; and
- to maintain a good working environment.

([9]) Case example carried out by Nicolaj Ejler, PLS Ramboll, Åarhus, December 2000. The study involved interviews with an area manager, a safety representative and a home care assistant. Furthermore the following reports and documents were used: (1) Report on the working conditions of home care assistants employed by the Municipality of Herlev (1992); (2) The annual review of the Elder Care Department in the Municipality af Herlev (1999); (3) Newsletter on the absence due to illness level for employees in nine municipalities in the Copenhagen area (1998); and (4) IOHA report to ILO on an International OHSMS (1998).

From the very beginning worker involvement was seen as critical, and this has been a continued element in the OSHMS. Some elements of the OSHMS are directly linked to OSH issues, while others are established in order to create a supportive structure in the work place. The OSHMS consists of the following elements:

- workplace assessment
- courses and training
- communication systems
- absence interviews
- support teams
- performance measures
- paper on service standards
- work teams
- management review
- flexible timetables.

The system integrates all levels of personnel and the City Council. Training and courses are conducted by trained ergo-therapists and physiotherapists. Many advantages have risen from the implementation of the OSHMS. The main result has been that days lost through illness have decreased dramatically. Furthermore clients are more satisfied with the services provided by the Home Care Unit.

Assessment

The type of OSHMS in Herlev is a mix between a sophisticated behavioural approach and an adaptive hazard management approach.

The system's strength lies in the high degree of employee involvement, and the fact the system focuses equally on controlling work related hazards and creating a good working environment for the home care assistants. Workplace assessment and the training programme, as well as the establishment of a supportive structure, are very important elements in this respect.

Over the last decade the OSHMS has evolved from a very traditional management system, with little employee involvement, into an innovative system with a high degree of employee involvement. It also seems that the OSHMS is a mix between a 'safe place' and a 'safe person' control strategy. On the one hand most of the work-related injuries are not caused by singular incidents but by long-term damage and a behavioural control approach is very important in this respect. On the other hand an efficient system, which can identify and assess hazards, is very important, because of the changeable nature of the workplace. The type of OSHMS in Herlev is therefore a mix between a sophisticated behavioural approach and an adaptive hazard-management approach.

The concluding recommendation on how to set up an OSHMS can be summed up as follows:

- Involve the employees in the risk identification and problem solving stages of implementation.
- Allocate sufficient resources for the proper functioning of the OSHMS.
- Change the organisational structure, in order to establish direct communication between managers and employees.

- Integrate the OSHMS in the overall management system, by involving both strategic and operational levels of management in the OSHMS.
- Establish an educational system.

Initiation — OSH input	Implementation — OSH process	Evaluation — OSH feedback
Management commitment and resources	✓ Training system	Communication system
Regulatory compliance and system conformance	Technical expertise and personnel qualifications	Document and record management system
Accountability, responsibility and authority	Hazard control system	Evaluation system
✓ Employee participation	Process design	Auditing and self-inspection
	Emergency preparedness and response system	Incident investigation and root-cause analysis
	Hazardous agent management system	Health/medical programme and surveillance
	Preventive and corrective action system	
	Procurement and contracting	
Formulation — OSH process	**Effects — OSH output**	**Improvement/integration — open system elements**
Occupational safety and health policy	OSH goals and objectives	Continual improvement
Goals and objectives	Illness and injury rates	Integration
Performance measures	Workforce health	Management review
System planning and development	Changes in efficiency	
Baseline evaluation and hazard/risk assessment	✓ Overall organisation performance	
OSHMS manual and procedures		

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3.4 MITTELDEUTSCHE BRAUNKOHLENGESELLSCHAFT (MIBRAG), THEIßEN ([10])

- Innovative and employee-oriented management system
- Going beyond German legal requirements
- Higher motivation due to involvement of employees
- Significant drop in accident rate

Background

MIBRAG has its origins in a former East German enterprise that was privatised after German reunification. In 1994 the privatisation contract was signed between the consortium, consisting of one British and two American companies, and the office for privatisation. Together they took over MIBRAG with 3 900 employees.

The new management continued restructuring in order to fulfil the company's aim which is that of constant and efficient delivery of coal for power generation in the field of base and medium loads, district heat and the supply of dust and briquettes. Currently MIBRAG operates two open-cast mines, three power stations and two benefaction plants. Since the takeover by the consortium, competition on the energy market has become more fierce. This has lead to a loss of 48 % in the sales of briquettes. As a consequence the number of employees has also decreased. Today MIBRAG employs about 1 732 people.

Facts

MIBRAG's occupational safety and health management system is a system based on an Anglo-American concept of safety. According to the management, occupational safety and health is the company's number one goal and thus their priority. The awareness of responsibility is supposed to be internalised on all management levels and applied on a daily basis.

To this end, MIBRAG has set up an OSHMS that not only lives up to legal requirements in Germany (mining legislation, regulations of the statutory accident insurance, legislation concerning health and safety at work, etc.) but often goes beyond these requirements with respect to many aspects. One of the first steps was to appoint a director responsible for occupational health, safety and the fire brigade.

MIBRAG has an OSHMS at its disposal, which is currently orientated in two main directions for the implementation of the occupational safety philosophy:

- 'Vision 2000' (the vision of being an accident-free company),
- the programme for occupational safety and health within MIBRAG 'PAGS'.

([10]) Case study undertaken by Helmut Hägele and Kerstin Dopatka, ISG, Cologne, December 2000.

Both directions have been agreed by the management as well as by the work council. PAGS is based on the strong involvement of all employees. It contains contests, encourages participation in the design/layout of the workplace, as well as the identification and elimination of risks. Regular occupational safety training is another issue of PAGS.

From the outset, stringent documentation of all assessments, reviews, accidents, risks, proposals and plans is carried out. A well-planned communication system supports the quick and complete distribution of OSH-related issues and news. The basis for PAGS and 'Vision 2000', and for a new division of responsibilities was a thorough risk analysis. The training, based on these analyses, takes into account all different demands at different levels – from management to workers.

The enterprise has been successful with its safety management system. Compared with other enterprises of the same or of similar industries, MIBRAG's accident rate is well below the average. While in 1993, 2.95 accidents per 200 000 hours worked occurred, the number has dropped to 0.28 accidents per 200 000 hours worked in 2000.

Management is determined to reduce the accidents and work related illnesses yet further. Consequently, risk reviews safety audits and meetings continue to ensure continuous improvement. Individual action plans place responsibility upon every single employee for himself and his work environment.

Assessment

MIBRAG's OSHMS can be characterised as an innovative and employee-oriented management system.

The OSHMS of MIBRAG has been successful so far. MIBRAG was presented with the gold award by the Royal Society for the Prevention of Accidents (UK) in the year 2000 for its achievement. Making occupational safety and health the enterprise's main goal is a step which few companies dare to take. Of course, economic reasons also play a role in these considerations. By reducing the number of accidents, lost work time is reduced as well, resulting in substantial cost savings.

The advantages of MIBRAG's OSHMS are, among others, a detailed plan, which defines most of the activities for the next three years. Furthermore, the involvement of all employees leads to higher motivation and to a better awareness of hazards, but also to a stronger identification with the company. Other advantages are top management's personal commitment towards safety and the consequent implementation of the programme.

One disadvantage is the strong focus on preventing work accidents, while not as much attention is paid to the prevention of work-related illnesses.

Initiation — OSH input	Implementation — OSH process	Evaluation — OSH feedback
✓ Management commitment and resources	Training system	Communication system
Regulatory compliance and system conformance	Technical expertise and personnel qualifications	✓ Document and record management system
Accountability, responsibility and authority	Hazard control system	Evaluation system
✓ Employee participation	Process design	Auditing and self-inspection
	Emergency preparedness and response system	Incident investigation and root-cause analysis
	Hazardous agent management system	Health/medical programme and surveillance
	Preventive and corrective action system	
	Procurement and contracting	
Formulation — OSH process	**Effects — OSH output**	**Improvement/integration — open system elements**
Occupational safety and health policy	OSH goals and objectives	Continual improvement
Goals and objectives	✓ Illness and injury rates	Integration
✓ Performance measures	Workforce health	Management review
System planning and development	Changes in efficiency	
Baseline evaluation and hazard/risk assessment	Overall organisation performance	
✓ OSHMS manual and procedures		

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3.5 BUILDING HIGHWAYS IN GREECE, THE ATTIKI ODOS CONSORTIUM ([11])

- Typology: Traditional/safe place OSHMS
- Traditional engineering and design
- Consortium of 11 private construction companies
- Planning and documentation of OSH issues (SAY and FAY)

Background

In comparison with most other European Member States, Greece has a relative short history in the fields of occupational safety and health. Even to this day both the legal institutional framework, as well as the practice at company level, of occupational safety and health needs further development. The construction sector, which is of particular importance to the Greek economy, has only had its legal framework up-to-date since 1996 (Presidential Decree PD 305/98).

Eleven private Greek property companies participate in the Attiki Odos consortium and are instructed to plan, build, maintain and use a three-lane motorway similar to an *autobahn* that bypasses the centre of Athens. An occupational safety and health management system is for the first time being developed and used in the construction sector (according to PD 305/98).

Facts

The following serves as basis for occupational safety and health:

- the plan for safety and health (SAY);
- the file for safety and health (FAY).

The content and function of both abovementioned obligatory concepts were determined by the technical instructions of the recently-introduced legislation.

The following specialists participate in the application of the occupational safety and health management systems:

- a general coordinator for safety and health;
- a safety technician for each construction site within the whole project;
- an industrial practitioner for each construction site within the whole project.

The SAY includes occupational safety and health regulations for the following issues:

- methods for personal protection and first aid;
- environmental protection;
- traffic check, protective signs and signposting;

([11]) Case study undertaken by Valter Fissamber, VfA, Athens, December 2000.

- electric installation;
- workroom protection;
- fire prevention;
- machines and equipment;
- cranes and other equipment;
- erection of scaffolding, wood formwork, concreting;
- transport and storage of material;
- hazardous agents;
- handling of loads;
- exceptional situations — removal of all workers from the construction site;
- blasting operations.

The Ministry for Labour (with the help of its work inspectors) undertakes regular inspections (nine times during the year 2000). The fact that a large proportion of the workforce is on a temporary basis possibly played a role here.

The SAY and FAY of Attiki Odos are not directly connected to other systems such as the management system.

The safety coordinator is directly subordinated to a member of the board. This relationship has a mainly operational character.

No quantitative set targets exist for occupational safety and health. However, some basic information is recorded in the FAY. This information forms also the basis for official statistics and indicators.

Assessment

The type of OSHMS is a traditional safe place and a traditional engineering and design one

It is too early to assess the effects of this system as it has only been operational for 12 months. However, all participants are of the opinion that positive effects can already be seen.

Some points of criticism (when considering the outlined situation) are that:

- so far, not enough has been done for the education and the creation of safety awareness among the employees;
- the know-how of external experts was not obtained;
- many elements of occupational safety and health are carried out formally, but not (yet) substantially;
- there is no influence by the social partners;
- no external consultancy was called in to complete the SAY and FAY.

Initiation — OSH input	Implementation — OSH process	Evaluation — OSH feedback
Management commitment and resources	Training system	Communication system
Regulatory compliance and system conformance	Technical expertise and personnel qualifications	✓ Document and record management system
Accountability, responsibility and authority	Hazard control system	Evaluation system
Employee participation	Process design	Auditing and self-inspection
	Emergency preparedness and response system	Incident investigation and root-cause analysis
	Hazardous agent management system	Health/medical programme and surveillance
	Preventive and corrective action system	
	Procurement and contracting	
Formulation — OSH process	**Effects — OSH output**	**Improvement/integration — open system elements**
✓ Occupational safety and health policy	OSH goals and objectives	Continual improvement
Goals and objectives	Illness and injury rates	Integration
Performance measures	Workforce health	Management review
System planning and development	Changes in efficiency	
Baseline evaluation and hazard/risk assessment	Overall organisation performance	
OSHMS manual and procedures		

Contact details

No contact details available.

3.6 UNIVERSITY COLLEGE OF CORK, CORK ([12])

UNIVERSITY COLLEGE, CORK
Coláiste na hOllscoile Corcaigh

- Traditional safe person approach with some basic elements of a sophisticated behavioural style
- Integration as focus for OSHMS
- Increasing awareness of OSH

Background

About 2 500 persons are employed at the University College of Cork (UCC). All of them are spread across different areas and seven faculties that are hardly linked. Each faculty itself is also divided into several departments. Despite this, there are various institutes and units such as the library or the Building Section. Most areas of activities and members of staff are independent from each other. The core of this organisation can be found on the traditional campus, with the first accommodation of the old 'Queens building' going back to the 1840s. On the campus, respectively around this Queen's complex, subsequent enlargements and extensions have been added. However, much of the occupied space is literally spread all over the city of Cork, accommodated in many previously residential buildings close to the campus and in industrial estates which have been adjusted according to the needs of the College.

Facts

The structure and size of the University College translates into a variety of tasks for the OSHMS which are subdivided into three areas:

- dangers
- issues of working time
- questions regarding students' safety.

The operation of the OSHMS is the task of a small unit, i.e. the College Safety Officer, the Assisting Secretary and the Administrative Secretary. The task and work of the unit is laid down in the Safety Statement of the College, which comprises the management system, the information on hazard control, and activities on the departmental level.

The background of the OSHMS consists of a wide array of legislative initiatives and regulations at the national and international level. Here, the European dimension is emphasised as a kind of 'initial accelerator'.

Integration is a central point of interest and provides the focus for the OSHMS. In the context of the University College, integration is based on the principle of 'education'. It shall be achieved by setting up a system of direction and control, and is frequently being updated. Control in this context is not concerned with setting up a formalised and structured system

([12]) Case study undertaken by Dr Peter Herrmann, ESOSC, Cork, December 2000.

of requirements, but is employed by providing a framework, which makes self-control possible, stimulates its implementation and motivates for permanent reflection of risks and ways of avoiding them. This is of special importance because, seemingly, the work itself is not especially exposed to health and safety risks and because the work itself is, as said before, highly individualistic.

The obligation of assessing risk factors in the immediate working environment, the provision of checklists and the adaptation by the members of the individual and very different departments in line with the specific requirements is, seen in this light, to some extent a way of compensating for the individualising framework.

Assessment

The occupational safety and health management system of the University College of Cork is a traditional 'safe-person' approach with some basic elements of a sophisticated behavioural style.

As a result there is an increasing awareness as regards safety and health issues, while a collective system of responsibility is yet to be achieved. The increase in the number of participants in activities aimed at education and training in OSH issues indicates the growing awareness.

The OSHMS of UCC turns out to be very individualistic in scope and mode. It shows an open approach, which can lead to a problem of the accessibility of data. This could be helped by becoming more formalised through:

- regular evaluation
- [on the basis of] systematic questions of assessment, but
- leaving enough space for applying the general criteria in the context of individual circumstances.

Another problem is the lack of communication between the staff, especially across different departments. Perhaps the introduction of systems of rotation could, in part, overcome the problem.

Initiation — OSH input	Implementation — OSH process	Evaluation — OSH feedback
Management commitment and resources	Training system	Communication system
Regulatory compliance and system conformance	Technical expertise and personnel qualifications	Document and record management system
Accountability, responsibility and authority	Hazard control system	Evaluation system
Employee participation	Process design	✓ Auditing and self-inspection
	Emergency preparedness and response system	Incident investigation and root-cause analysis
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	Preventive and corrective action system	
	Procurement and contracting	
Formulation — OSH process	**Effects — OSH output**	**Improvement/integration — open system elements**
Occupational safety and health policy	OSH goals and objectives	Continual improvement
✓ Goals and objectives	Illness and injury rates	Integration
Performance measures	Workforce health	Management review
System planning and development	Changes in efficiency	
Baseline evaluation and hazard/risk assessment	Overall organisation performance	
OSHMS manual and procedures		

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3.7 THE MANUFACTURING OF HEARING DEVICES BY AMPLIFON, MILANO ([13])

- Risk evaluation and not 'blind obedience'
- Workers participate in reporting risks
- Absence of accidents
- Continuous planning of improvements

Background

Amplifon is a leader in the manufacturing and retailing of hearing appliances, with an R & D centre and a network of approximately 300 shops (including own shops). It has 500 employees (1 000 including sub-agents and branch agents).

Facts

According to decrees Nos 626 of 1994 and 242 of 1996 — which implement EU Directives – the OSHMS at Amplifon is governed by a safety management document compiled in 1996, containing:

- a report on the occupational health and safety risk evaluation, which also specifies the criteria employed in the evaluation of risks. The company shows a low overall level of risk;
- the identification of preventative and protective measures and personal protective equipment to adopt as a result of the evaluation;
- a programme of measures designed to improve future levels of safety.

This lead to the introduction of the following basic principles:

- 'Risk evaluation' and not 'blind obedience' to regulations; organisational measures, health regulations, emergency plans, worker consultation and representation, environment and equipment maintenance, instructions and training for workers.
- Identification of the tasks and duties of the employer, workers, prevention and safety service managers, the doctor responsible, and workers' safety representatives, all of whom form part of the 'safety system'.
- Responsibility distributed throughout the firm.

These principles are implemented through the following process:

- *Input*: workers participate in reporting risks, and any change is discussed with them;
- *Implementation*: the company philosophy is 'safeguarding the health and safety of workers is a collective good', and the creation of safe conditions is a quality factor. Action taken in the workplace concerns: the presence of emergency exits (two on each floor, access to which must not be obstructed); adequate lighting of the workplace; instructions with a

([13]) Case study undertaken by Dott. Andrea Forti, Istituto per la Ricerca Sociale, Milano, December 2000.

plan on each floor to remind workers of what to do if there is a fire; signs on each floor informing visitors from outside of possible hazards; rest rooms (above all for laboratory workers who must have a break of 15 minutes every two hours); and passageways flooring (which must be of non-slip material);

- *Information:* connected with specific risks connected with individual job functions is provided and training is given (this is also the case for an employee who experiences a change of job function);
- *Effects*: evaluation of the functioning of the safety system involves periodic visits and inspections, safety drills, and three-monthly training courses on health and safety for head office and branch employees. No accident has occurred in the workplace over the years.

Assessment

Self-assessment: goals concerning worker health and safety are pursued by means of continuous planning of improvements. The company philosophy is that of doing what is necessary 'and not doing things for the sake of doing them', making workers responsible and encouraging their involvement. Evaluation provides useful feedback, the value of which is demonstrated by the absence of accidents in the workplace. According to this indicator the safety system described must, therefore, be considered efficient. Furthermore, periodic meetings (between the employer, the prevention and safety manager, the general services manager and workers' safety representatives) are held to check on the developments and results of the safety programme, and to discuss new improvements and action for informing and training workers.

Strengths and weaknesses of the Amplifon OSHMS can be summarised as follows:

STRENGTHS	WEAKNESSES
A culture of company safety	Some difficulties, due to slow internal communication of changes in work station locations and in the use of rooms between senior management and workers
Low level of risk	Possible tendency to propose action that is superfluous and not always necessary
High worker participation	
Timely and accurate instruction and training of workers	
Good working environment conditions	
Effective system (no accidents at the workplace have occurred)	

Initiation — OSH input	Implementation — OSH process	Evaluation — OSH feedback
Management commitment and resources	✓ Training system	Communication system
Regulatory compliance and system conformance	Technical expertise and personnel qualifications	Document and record management system
Accountability, responsibility and authority	Hazard control system	Evaluation system
✓ Employee participation	Process design	Auditing and self-inspection
	Emergency preparedness and response system	Incident investigation and root-cause analysis
	Hazardous agent management system	Health/medical programme and surveillance
	Preventive and corrective action system	
	Procurement and contracting	
Formulation — OSH process	**Effects — OSH output**	**Improvement/integration — open system elements**
Occupational safety and health policy	OSH goals and objectives	✓ Continual improvement
Goals and objectives	✓ Illness and injury rates	Integration
Performance measures	Workforce health	Management review
System planning and development	Changes in efficiency	
Baseline evaluation and hazard/risk assessment	Overall organisation performance	
OSHMS manual and procedures		

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3.8 SERMELUX S.A., KEHLEN ([14])

- Innovative/safe place and adaptive hazards management
- Zero accident rate
- New employees receive guidelines with safety instructions when they start

Background

The enterprise Sermelux A.G. was founded in 1979 and is the parent company of a group. In total, 160 employees work for Sermelux, of whom more than half are employed at Sermelux A.G. directly. Its business is the building industry and civil engineering, with a special concentration on metalwork. Among others, Sermelux builds all kinds of steel facades, doors, glass roofs and installs fire protection isolating works. Two-thirds of the staff work in production — either in one of the production halls or on the building site. The main customers of Sermelux are large trade enterprises and institutions and not usually private individuals.

At Sermelux there is one manager who is in charge of the enterprise's development according to the company's main philosophy and the following keywords: quality, transparency, communication and service. The employees are expected and encouraged to structure their work independently and responsibly. In order to offer a good working atmosphere, Sermelux endeavours to create comfortable and motivating working conditions. All employees have the freedom to work without undue pressure of time; quality and safety being considered as more important than mass production. Risks and hazards in Sermelux are mainly isolated to the production area and the building sites.

Facts

The OSHMS of Sermelux was introduced in 1991. It is based on a philosophy that attempts to create comfortable workplaces in order to support a general feeling of comfort and identification with the company. This workplace shall meet the demands of safety, health and aesthetics (harmony). Most of the production is realised in the industrial hall, where risks can be minimised through the creation of a safe environment, although interventions outside hold a greater risk potential and are more difficult to assess. This explains the company's investment policy in the most up-to-date industrial environment.

([14]) Case study undertaken by Anne Marie Kaiser, ACORD International S.A., Luxembourg, December 2000.

The Sermelux OSHMS adheres to the national guidelines, the *Code de la Sécurité et de la Santé au Travail* which includes information on several laws, regulations and instructions, set up by the labour inspectorate. The management system is connected with the EU Directive 89/391/EEC, which obliges enterprises to appoint one representative to be responsible for occupational safety and health.

The main goal of Sermelux's OSHMS is the reduction of accidents to the point that no more occur. 'Zero-accident level' is what they want to reach. In the final implementation this means four main steps:

- detailed analyses of risks,
- regular training and instruction,
- exact distribution of responsibilities,
- the abolition of any risk that becomes obvious.

All employees are asked to join the occupational safety and health system with their own ideas. They can air their opinions and complaints to their superiors, who will either deal with the problem or pass it on to the management. Additionally, every superior is responsible for the distribution of information referring to occupational safety and health.

For Sermelux it is very important to develop instructions which are clear and easy to understand. Every employee shall be made aware of his tasks and responsibilities in order that misunderstandings and the resulting risks can be avoided. Simple signals and signs shall draw the attention of the workers and sharpen their awareness of dangers. For those who work on the building sites, certain security plans have to be drawn by the site managers.

Sermelux spends an average, annual amount of about 100 000 EUR on further education relating to occupational safety and health. To implement the OSH, the company engaged two academics who have taken over the task of coordinating the different activities, as well as training and monitoring the company's position as regards the regulatory environment. In addition to the two security managers, a workers' representative completes the OSH team.

Further steps have included risk analyses and preparatory work for the avoidance of risks on the external building sites. Every new employee receives guidelines as to safety when he starts.

One of the attempts in order to avoid accidents consists of the reduction of human interventions. All of the machines are checked on a regular basis and the company tries to work with both modern and advanced working instruments.

Assessment

This OSHMS type is an 'innovative/safe place and adaptive hazards management'.

According to the company, the accident rate at Sermelux is quite low. There are hardly any cases of employees who stay at home as a result of a work-related accident or illness for longer than a week. Further advantages are that:

- the integration into a holistic enterprise's philosophy takes into account not only occupational health and safety but also the general state of the employees, environmental factors, etc.;

- the prevention system is broadly extended and implemented onto all areas, both machines and fields;
- the distribution of responsibilities creates a higher competence as well as a motivation and identification with the company;
- simplicity of language and signals leads to a common understanding that makes information accessible to everyone;
- regular training keeps the staff aware.

As a disadvantage, the relatively high cost can be mentioned. Continuous investments in training, the newest machines, etc. can not be avoided. Yet it seems that the increased productivity is able to compensate for this.

Initiation — OSH input	Implementation — OSH process	Evaluation — OSH feedback
Management commitment and resources	✓ Training system	Communication system
Regulatory compliance and system conformance	Technical expertise and personnel qualifications	Document and record management system
Accountability, responsibility and authority	Hazard control system	Evaluation system
Employee participation	Process design	Auditing and self-inspection
	Emergency preparedness and response system	Incident investigation and root-cause analysis
	Hazardous agent management system	Health/medical programme and surveillance
	Preventive and corrective action system	
	Procurement and contracting	
Formulation — OSH process	**Effects — OSH output**	**Improvement/integration — open system elements**
Occupational safety and health policy	OSH goals and objectives	Continual improvement
Goals and objectives	Illness and injury rates	Integration
✓ Performance measures	Workforce health	Management review
System planning and development	Changes in efficiency	
Baseline evaluation and hazard/risk assessment	Overall organisation performance	
OSHMS manual and procedures		

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3.9 PRODUCING TILES, PAVEMENTS AND CERAMICS BY BALLESMAR, ONDA ([15])

- Traditional management system
- Zero accident rate
- Seven basic principles
- Integral safety

Background

Ballesmar is an expanding tile producing company that was founded in 1949. At the moment it covers an area of 13 519 m² and shows an annual average production of 5 000 000 m² of tiles, pavements and ceramic linings. Estimates for 2001 predict a doubling of last year's production. Today, about 142 employees work at Ballesmar. The products are sold throughout all regions of Spain as well as to clients all over the world. A variety of suppliers sell goods to the enterprise, among them the following branches represented most: clay, glaze, cardboard, energy and machinery. Especially during the work with the raw materials, there is a high risk of accidents. From pressing up to drying, glazing and firing, many industrial machines are involved that need experienced and correct handling.

Facts

The occupational safety and health system of Ballesmar is based on several legal regulations, obligations and ordinances. One of the basics is Article 2 of the Prevention Services' Regulation (Real Ordinance 39/1997, 17 January). This article relates to the 'establishment of an action of prevention of risks, integrated in the company' and 'the introduction of a plan of the prevention of risks that includes organisational structure, the definition of functions, the practices, the procedures, the processes and the necessary resources to carry out the action'.

For Ballesmar, the main reason for the implementation of an OSHMS was this strict statutory regulation of OSH subjects. Further articles such as Article 14, which entitles all workers to effective protection and the manager's duty to fulfil this protection, pushed the development forwards. An additional factor was the activity of trade unions and workers' groups.

When Ballesmar began implementing the OSHMS, it started with defining its main goal: the integration of prevention into the daily administration of the organisation and the continuous improvement of working conditions through good administration of technical and human resources. For this, the ideal and focused result was an accident rate of zero. Questions of safety, hygiene and health should acquire an equal importance to excellence, quality, productivity and internal cohesion. The company's seven basic principles were established as follows:

([15]) Case study undertaken by Pilar Vivas, Universidad Politécnica de Valencia.

1. Management's leadership
2. Formation, information, participation and consultation
3. Safety integration in the different phases: conception, production, exploitation
4. Workers are the true actors of prevention
5. Prevention and quality of life
6. Risk control
7. All accidents must be investigated and any dangerous action and unsafe practice must be inspected and corrected

From the start there was a high commitment of management towards these objectives, but also the participation of all employees needed to be encouraged. This means that all staff needed to participate in efforts towards planning and prevention while the management had to provide the necessary resources for the improvement. External specialists as the 'Mutual of Accidents' and a 'Service of Prevention' got involved in order to help and consult with their professional experience.

'Integral safety' means the involvement of all members of all levels into all performances and decisions to be made within the concerned topic. A positive attitude towards prevention is encouraged in order to achieve ultimate effectiveness in the development of safety. Responsibility for one's own surroundings is one of the main traits of this philosophy. Special groups were set up in order to inform, advise and discuss new ideas. Special assessment groups chose the priorities on the agenda of OSH subjects. The steps, which should be taken in order to progress in the OSH work consisted of risk analysis, risk identification, risk evaluation and risk control.

Part of the Ballesmar OSHMS is the training, especially of new staff. Signals, hinting at safety and caution, are spread over the company and special programmes broaden the employees' awareness and attention. The hired 'Mutual Company' carries out an inspection programme that includes constant revision of the risk evaluation, revision of the action plan, the investigation of accidents and evaluation of new risks.

Assessment

This management system comes closest to the category of a traditional management system.

The number of accidents at Ballesmar shows a rate below the sector's average. The employees' motivation seems to have increased since the implementation of the OSHMS — a high participation rate and good awareness of safety are the best indicators for this. Since the implementation of the OSHMS, the number of accidents dropped slightly while production was increased.

There are certain advantages, which represent the character of the OSHMS:

- high participation of employees
- strong management commitment
- training of new staff
- prevention as integration into the daily administration and organisation
- integration of trade unions.

Some disadvantages are identified in progress of change, e.g.:

- the emergency plan has to be adapted to the expanded situation of the company;
- some points of conflict remain, where the prospective results have not yet been achieved.

The Ballesmar OSHMS shows good integration and participation of employees. Responsibilities are passed down from the managing director to those workers at a lower level. The worker's chance of effective contribution however remains relatively limited.

	Initiation — OSH input	Implementation — OSH process	Evaluation — OSH feedback
✓	Management commitment and resources	✓ Training system	Communication system
	Regulatory compliance and system conformance	Technical expertise and personnel qualifications	Document and record management system
	Accountability, responsibility and authority	Hazard control system	Evaluation system
✓	Employee participation	Process design	Auditing and self-inspection
		Emergency preparedness and response system	✓ Incident investigation and root-cause analysis
		Hazardous agent management system	Health/medical programme and surveillance
		Preventive and corrective action system	
		Procurement and contracting	
	Formulation — OSH process	**Effects — OSH output**	**Improvement/integration — open system elements**
	Occupational safety and health policy	OSH goals and objectives	Continual improvement
	Goals and objectives	✓ Illness and injury rates	Integration
✓	Performance measures	Workforce health	Management review
	System planning and development	Changes in efficiency	
	Baseline evaluation and hazard/risk assessment	Overall organisation performance	
	OSHMS manual and procedures		

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3.10 OSH AND TOTAL QUALITY MANAGEMENT IN BERGLANDMILCH COMPANY, GRAZ ([16])

- OSH and total quality management (TQM)
- Semi-integrated management
- Implementation process
- Commitment of management

Background

Berglandmilch is an enterprise in the food industry and has about 1 000 employees. Its main activities consist of the production and marketing of a variety of milk products such as milk, cheese and yoghurt. The company's main customers are supermarkets and its main suppliers are dairy farmers. The company merged from six agricultural cooperative societies in the mid-1990s. There are ten production sites with an annual turnover of about 529 Mio EUR (1999). In 1998 the enterprise won the Austrian Quality Award (AQA) for Business Excellence.

In this period there was an increase in the number of occupational accidents. This was one of the main reasons for the implementation of an OSHMS in the company. In order to achieve the main objectives of a lower accident rate and a safer workplace, the focus was on:

- the improvement of communication with the authorities; and
- compliance with OSH obligations.

OSH efforts should be intensified, and also the synergy between the OSH management, quality management and environmental management should be strengthened.

Facts

Some important elements of an OSH management system already existed before the establishment of the present OSHMS:

- the systematic analysis and assessment of risks;
- the setting of adequate measures to reduce these risks;
- the existence of OSH representatives.

During the implementation process, the following main steps were carried out:

- analysis and assessment of risks
- setting of improvement measures
- employee instructions and training
- safety inspections
- audits
- implementation of continuous improvement system, and
- near accident registration system.

([16]) Case study undertaken by Dr Andreas Wittmann, TU Wien, December 2000.

The following issues were prioritised within the establishment and implementation process.

- the commitment of business management towards OSH
- a systematic basic training for new employees concerning the topics quality, environment, OSH and hygiene.

There is also a need for constant training and instruction for all employees. The employees are encouraged to set up initiatives and measures of improvement by implementing self-assessment teams, carrying out internal audits and establishing improvement and innovation teams. All this is aimed at creating and encouraging employee awareness of prevention.

Near-accidents have to be registered systematically and the relevant causes must be eliminated. Facilities were inspected systematically and work-related risks evaluated, analysed and assessed. Measures have been set based on the required improvement. Internal and external audits, reviews, risk analyses and assessments are a systematic element of the system and give further inputs for progress. A hazard control system considers the measures and system elements described above.

There exist OSH representatives and an occupational medicine as well as an emergency MS and a bulletin for contractors dealing with safety, environment and hygiene.

The analysed enterprise now registers the traditional OSH relevant performance indicators of 'lost time accidents' and 'number of staff away sick'. On the basis of the OSHMS standard SCC, the OSH relevant legal obligations and the principles of total quality management (TQM), the performance regarding OSH is being measured systematically. Constant improvement is an inherent element of the OSHMS. The MS is developed and improved by using the outputs of the performance measurements. Basic elements of the EU legislation concerning OSH are the identification, evaluation and assessment of risks.

Berglandmilch finished its initial analysis and assessment of risks three years before legally required. On one side there is the requirement to document the evaluation and hazard/risk assessment by law, while on the other there exists a so-called 'generic management system'. Based on the 20 elements of the ISO9000:1994- further topics like environment and OSH are added.

Basic training for new employees is offered, concerning topics such as quality, environment, OSH and hygiene.

One main barrier to be overcome during the implementation of the OSHMS was the employees' sceptical attitude towards management systems. The most important group for implementing the OSHMS were the employees.

The organisation always seeks ways to achieve ongoing improvement of overall business performance. TQM provides the overall management system framework. Here theme centres' management systems for quality, environment and OSH are embedded but because of the company's size and its complexity there is a need to separate the management system topics.

Several successes can be put down to the implementation of the OSHMS. Lost time days per employee caused by accidents fell from 1.23 in 1998 to 0.65 in 1999 although no figures exist for a longer period. The accident frequency as defined by the standard SCC decreased from 47.56 in 1998 to 37.02 in 1999.

Assessment

This case most resembles a semi-integrated management system with several links and common elements.

As a TQM-oriented enterprise, Berglandmilch has implemented an effective overall communication system, which integrates quality, environment and OSH tasks. Furthermore, the highly-advanced TQM businesses widely demonstrate a distinct OSHMS. Additionally, implementing TQM requires extensive employee qualification. Qualification measures are one means to empower people. In connection with the principles of empowerment this will also lead to a health-promoting situation for the employees.

The analysis in this case study shows an overall picture of a pronounced training culture and extensive training efforts. This is expressed in increasing training budgets during the last few years. Benefits in all aspects of business performance are evident because of the systematic OSH management. This ranges from employee satisfaction to hard facts, e.g. accident frequency and sick leave. The standard SCC shows only reduced MS understanding, ostensibly not fitting for a large-scale business. The case study business also carried out a certification of its OSHMS according to the standard SCC for obtaining third-party input and feedback. The SCC elements provide some important initial hints regarding the elements of OSHMS. Based on these, further steps can be undertaken, which are even more far-reaching than SCC.

Initiation — OSH input	Implementation — OSH process	Evaluation — OSH feedback
✓ Management commitment and resources	✓ Training system	Communication system
Regulatory compliance and system conformance	Technical expertise and personnel qualifications	Document and record management system
Accountability, responsibility and authority	Hazard control system	Evaluation system
Employee participation	Process design	Auditing and self-inspection
	Emergency preparedness and response system	Incident investigation and root-cause analysis
	Hazardous agent management system	Health/medical programme and surveillance
	Preventive and corrective action system	
	✓ Procurement and contracting	
Formulation — OSH process	**Effects — OSH output**	**Improvement/integration — open system elements**
Occupational safety and health policy	OSH goals and objectives	Continual improvement
Goals and objectives	✓ Illness and injury rates	✓ Integration
Performance measures	Workforce health	Management review
System planning and development	Changes in efficiency	
Baseline evaluation and hazard/risk assessment	Overall organisation performance	
OSHMS manual and procedures		

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3.11 LEYLAND TRUCKS, LEYLAND ([17])

- Adaptive-hazard management with strong sophisticated behavioural orientations
- Guiding principle is participation
- Reduction of accidents

Background

Leyland Trucks is an old family enterprise which was founded in 1896. Besides the production of vans for civil and military use, certain activities had been developed in the production of buses and tanks. Development since the mid-1970s was characterised by two strands. Economically this was dominated by the set of de-mergers. With regard to the technology of the production processes, this period was characterised by a process of rationalisation. As a result, the unit that is today known as Leyland Assembly Plant emerged in 1993. Since 1998, this unit is a subsidiary of Paccar Inc. — the share is 100 %. This constellation links Leyland to brands such as Kenworth, Peterbilt, DAF and Foden. Currently in the region of 1 000 people are employed in Leyland Trucks, producing about 14 000 trucks per year. The 600 000 square foot plant has two chassis lines, three 'rolling road' test booths and a high bay components warehouse, with a storage capacity of over 3.2 million cubic feet, which is the home of Paccar Parts in the UK. In order to confront the new economic and technological situation and their consequences, the implementation of a new occupational safety and health management system was carried out.

Facts

A flexible system had been developed basically of the type of an 'adaptive-hazard management' with strong sophisticated behavioural orientations. The guiding principle for integration is participation. Integration has, in this context, a twofold meaning. In substantial terms it is concerned with bringing together the different dimensions of the work as well of the product. The strategy aims in particular at the improvements in the process of production and the reflection of health and safety issues with regard to the product. It has to be emphasised that both dimensions are principally sensible because the product and its use respectively can bear specific and high risks. Thus the orientation on this combination of risks is especially challenging.

Furthermore the implementation of a participation-based strategy is as such already seen as important as regards safety and health issues. By this orientation it is secured that the approach goes beyond the top-down element, which is only a point of departure. As such it provides the framework and an 'administrative incentive' for activities in the area concerned.

([17]) Case study undertaken by Dr Peter Herrmann, ESOSC, Cork, December 2000.

However, this openness allows and moreover requires the going together of formally differentiated elements of the system. Security matters are thus dealt with across the borders of the individual unit and across the borders of single issues — including the consideration of product security. An example is the reporting system. Despite the simple elaboration of reports, this is concerned at the very same time with issues of immediate improvement. Furthermore, the educational aspect is especially in this connection of fundamental meaning — improvement of the safety and health situation in the enterprise is not least strongly connected with questions of consciousness with regard to the issues in question. Seen in this perspective the point, which makes Leyland especially interesting, is the processual character, i.e. the improvement of the overall situation by integrating mainstream safety and health issues, at least on the level of the individual enterprise.

Assessment

This system in operation can be characterised as a type of an adaptive-hazard management with strong sophisticated behavioural orientations.

The success can be seen in reduced accidents. This results immediately from increasing awareness as regards safety and health issues. On the one hand the risks are made out and precaution is taken in the sense of asking for and providing necessary security 'instruments' and means — as, for example, in the context of lifting heavy goods. On the other, the increasing awareness of handling processes, i.e. the readiness to make use of existing safety means and health-securing provisions, has to be mentioned as another important aspect.

Initiation — OSH input	Implementation — OSH process	Evaluation — OSH feedback
Management commitment and resources	Training system	Communication system
Regulatory compliance and system conformance	Technical expertise and personnel qualifications	✓ Document and record management system
Accountability, responsibility and authority	Hazard control system	Evaluation system
✓ Employee participation	Process design	Auditing and self-inspection
	Emergency preparedness and response system	Incident investigation and root-cause analysis
	Hazardous agent management system	Health/medical programme and surveillance
	Preventive and corrective action system	
	Procurement and contracting	
Formulation — OSH process	**Effects — OSH output**	**Improvement/integration — open system elements**
Occupational safety and health policy	OSH goals and objectives	Continual improvement
Goals and objectives	✓ Illness and injury rates	Integration
Performance measures	Workforce health	Management review
System planning and development	Changes in efficiency	
Baseline evaluation and hazard/risk assessment	Overall organisation performance	
OSHMS manual and procedures		

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4.

CONCLUSIONS

In many cases the need for further development of the existing occupational safety and health organisation was the reason for the implementation of an OSHMS. Therefore, most of the OSHMSs are based on former (partial) systems. For example, the German mining company MIBRAG modified its occupational safety programme by taking over components of the system used by their Anglo-American owners. The Greek Street building syndicate introduced a completely new occupational safety and health management system due to the national decree, which transposed the EU directive on safety and health on construction sites (92/57/EEC) into national law. The implementation of the Austrian dairy's integrated system was caused by an increase in the number of accidents at work.

Implementation and realisation

All producing companies chose forms of organisation which were directly connected to other management functions, e.g. AGFA related their OSHMS to ISO 9002. The example from Luxembourg showed that a very detailed OSHMS is part of the company's philosophy, which depicts exactly how work shall relate to health and aesthetic aspects. For the German mining company occupational safety is the company's number one objective and has the same priority level as other company goals.

For the implementation of the OSHMS the employees were consulted and involved in different ways. But very few examples show the consultation of external specialists for the development of OSHMS. In fact, only Sermelux (Luxembourg) used two experts.

The examples also underline the fact that the integration of an OSHMS into existing management systems is a difficult process which takes a long time to be finalised.

Effects of the OSHMS

Quantifiable objectives related to the introduction of an OSHMS could only be observed in a few cases. Companies that defined such objectives mostly referred to the 'zero-accidents' strategy. A reduction of accidents at work was achieved by those companies that had defined quantitative targets; e.g. the German mining company MIBRAG, AGFA Belgium and the Austrian Berglandmilch company. Another effect is the increase of employees' motivation. Even though this is not measurable in a quantitative way, many companies agreed that the productivity had risen with the implementation of the OSHMS.

Strengths and weaknesses

The concepts focus mainly on the prevention of accidents at work, while aspects of occupational diseases and work-related ill-health received less attention. The importance of OSH in the companies has different levels, e.g. in the Greek street-building company Attiki Odos or in part for the University of Cork, OSH is treated as a necessary measure. In the Luxembourg or in the Italian and German companies, OSH is seen as one of the most important elements of the company's philosophy. Regarding the achievements and successes, the enterprises' examples emphasise the necessity to declare occupational safety and health as an executive duty.

In general, the advantages of a strong OSHMS prevail in all those companies studied: the bigger companies especially, could reduce their numbers of accidents at work and thereby the working time lost. Further, OSHMSs strengthened the employees' motivation, e.g. by giving

them additional competencies. Besides that, OSHMSs increased the employees' identification with their company.

Weaknesses became visible wherever a necessary skill of communication or the competence of those persons involved could not be guaranteed. This happened especially in those cases where the integration of the employees was on a voluntary basis. Here, a lack of participation can be the consequent result. High costs (especially in the beginning) are another detrimental factor. The danger of a structural rigidity is given in the case of a daily routine.

In general, the enterprises' examples support the thesis that innovative management strategies are superior to those with a purely traditional background. The main advantages are:

- a systematic root analysis of hazards, risks and incidents;
- strong awareness of hazards and risks;
- improved transparency about internal processes;
- better communication among employees;
- stronger motivation and identification of employees with their company;
- extensive and integrated point of view in the sense of the working environment; and
- better measuring of the occupational safety and health performance.

The implementation of such a system is always accompanied by a considerable expenditure for the company and the further qualification of the employees is a necessary part this. Yet, the examples hint at the fact that the initiation and the implementation of an OSHMS have to be planned carefully and that the companies' specific conditions have to be considered. This is an important condition for a successful implementation.

ANNEX I LITERATURE ON OSH MANAGEMENT

Advisory Committee on Safety, Hygiene and Health Protection at Work: European Guidelines on the Organisation of Occupational Safety and Health, October 1999

Bayrisches Staatsministerium für Arbeit und Sozialordnung, Familie, Frauen und Gesundheit:

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