

ERMCO

EUROPEAN READY MIXED CONCRETE ORGANIZATION
ASSOCIATION EUROPEENNE DU BETON PRET A L'EMPLOI
EUROPÄISCHER TRANSPORTBETONVERBAND

ERMCO GUIDANCE MANUAL ON OCCUPATIONAL HEALTH AND SAFETY

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*To the Austrian, Finnish, French, Irish and Italian ready mixed concrete Associations
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SUMMARY

The aim of this Guide is to assist the European ready mixed concrete industry in making an assessment of the measures it adopts concerning the safety and health of its employees in all fields of its operations in the production and delivery of ready mixed concrete.

A review is made of the general principles, and their method of implementation, concerning the prevention of occupational risks, the protection of safety and health, the elimination of risk and accident factors and the informing, consultation, participation and training of workers and their representatives.

The recommendations given are based on the general requirements of the Safety and Health of Workers at Work Directive 89/391/EEC and its individual Directives.

In addition, guidance is given to assist companies in the development of a system for the management of Occupational Health and Safety (OH&S) in such a way as to protect employees and others whose health and safety may be affected by the companies' activities. Many of the features of effective OH&S management are already included in the management systems standards established for Quality (EN ISO 9000) and Environment (EN ISO 14000).

Despite the introduction of a number of relevant EC directives and EN ISO Standards, the approach to health and safety legislation and practice, in many respects, is still quite different from country to country in Europe. Moreover, the European Union itself is undergoing a period of profound change. The EU economy is becoming increasingly knowledge-based and the possession and transmission of information is assuming ever-greater importance. The revolution in information technology, and the vast sources of data available on the World Wide Web, means that this Guide can only be regarded as a starting point.

Wherever possible, the locations of relevant Internet Web sites in the legislative, environment and health and safety fields are given. Much of the information is available in 11 European languages and ERMCO Members are encouraged to visit these sites for themselves.

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1 DEVELOPMENT OF EU HEALTH AND SAFETY POLICIES

The need to improve working conditions is a collective concern, prompted by both humanitarian and economic considerations.

Within the framework of the European Coal and Steel Community (ECSC) created in 1951, efforts in the field of health and safety were initially motivated to reduce the significant number of deaths caused by explosions and fires in **coalmines** in Europe. Subsequently, activities were extended to **other extractive industries** for example surface and underground mineral-extracting industries: in 1957, the Safety and Health Commission for the Mining and Other Extractive Industries was set up to assist the Commission in the preparation of legislative initiatives to prevent the occurrence of major accidents in this sector. Indeed the accidents rate is higher within those industries than in any other, partly because of the risks of explosions, rock falls and workers falling. Respiratory diseases, such as pneumoconiosis, and diseases impairing hearing are frequent.

With the establishment of the **European Economic Community (EEC) in 1957**, the need for a global approach to the health and safety of workers became more and more evident. Since the last century, social policies had developed separately in the Member States, at different paces. It was realised that occupational health and safety should receive Community attention:

“Member States shall pay particular attention to encouraging improvements, especially in the working environment, as regards the health and safety of workers, and shall set as their objective the harmonisation of conditions in this area, while maintaining the improvements made”. Article 118a of Treaty of Rome, 1957.

From 1962 till 1966, the recommendations of the Commission were the first steps towards the **development of a community policy**; they included occupational medicine, the adoption of a European list of occupational diseases, the health surveillance of workers exposed to specific risks, the compensation of victims of occupational diseases and the protection of young people at work.

In 1974, the Advisory Committee for Safety, Hygiene and Health Protection at Work was set up in order to assist the Commission. Four-year **Action Programmes** were subsequently drawn up, with the agreement of industry. The following **directives** were adopted:

- Directive 80/1107/EEC of 27 November 1980 on the protection of workers against risks related to exposure to chemical, physical and biological agents at work
- Directive 83/477/EEC of 19 September 1983 on the protection of workers from the risks related to exposure to asbestos at work
- Directive 86/188/EEC of 12 May 1986 on the protection of workers from the risks related to exposure to noise at work

This reflected a shift from total dependence on national legislation towards widespread acceptance of the role of the European Community. Completion of the single European market was then meant to ensure competition and productivity; this also required higher standards concerning social policies. Hence the single market had to be complemented by **minimum requirements for health and safety at work**. This was given new impetus in 1987 with the adoption of the **Single European Act**:

- Member States must raise their level of protection if it is lower than the minimum requirements set by the directives. They may maintain or introduce more stringent measures for the protection of workers.
- The Single European Act is based on the principle of removing barriers to trade and allowing the free movement of goods across borders; only safe products should be placed on the market. This includes machines and personal protective equipment.

The first, and probably the most important, Directive providing for minimum requirements was adopted: Directive **89/391/EEC** of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work.

A Social Charter was signed in 1989 to ‘attach the same importance to social aspects as to economic aspects’. By guaranteeing certain rights, disparities in working conditions across Member States (hence distortions in competition) can be reduced. Continuing along this path, a Social Protocol was adopted in 1991 as part of the Maastricht Treaty, expressing the determination of all the European Union countries to make significant advances in social policy. This was then incorporated into the June 1997 **Amsterdam Treaty** on social policy, education, training and youth. This means that the European Union can get to grips with wider ranging problems such as the changes caused by new ways of organising production and work.

2 EUROPEAN COMMISSION LEGISLATION

2.1 The Safety and Health Framework Directive 89/391/EEC

Council Directive 89/391/EEC of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work, is the core of the Commission's strategy on health and safety directives. This is a Framework Directive on which all subsequent directives will be built and it will be supplemented by individual directives covering specific areas.

Prior to the adoption of the Framework Directive, Member States had to comply with specific directives on, for instance, noise and asbestos. However, implementation of the Framework Directive requires a much more active approach to health and safety and far more changes to broaden the scope of Member States' national legislation. As an example, it has been an innovation to many Member States that requirements must be followed to protect workers in the public sector.

In addition, with the modernisation of our workplaces, other specific areas will need to be targeted. New working environment problems (repetitive strain injuries, eyesight problems caused by Visual Display Units, etc.) have arisen as a result of automation and the introduction of new technology.

One of the objectives of the Framework Directive is to ensure the improvement of every aspect of health and safety of workers as well as a minimum of protection for all workers throughout the Member States. This means that the divergence between the legislation in Member States is substantially reduced.

The Framework Directive covers all workers in the European Community, privately as well as publicly employed, with the exception of the self-employed and domestic servants. The scope is thus intended to be extremely broad.

2.2 Scope of the Safety and Health Framework Directive 89/391/EEC

The Framework Directive creates the basis for all subsequent directives concerning the safety and health of workers at work. The Directive establishes the general rules for the protection of the health and safety of workers at the workplace which employers and employees are required to observe.

The essential features of the Framework Directive are summarised briefly as follows.

Article 1 Object

The object of this Directive is to introduce measures to encourage improvements in the safety and health of workers at work. It contains general principles concerning the prevention of occupational risks, the protection of safety and health, the elimination of risk and accident factors, the informing, consultation, balanced participation in accordance with national laws and/or practices and training of workers and their representatives, as well as general guidelines for the implementation of the said principles.

Article 2 Scope

This Directive shall apply to all sectors of activity, both public and private (industrial, agricultural, commercial, administrative, service, educational, cultural, leisure, etc.).

Article 3 Definitions

The Directive gives definitions for worker, employer, workers' representative, with specific responsibility for the safety and health of workers, and prevention.

Article 4 Implementation

Member States shall take the necessary steps to ensure that employers, workers and workers' representatives are subject to the legal provisions necessary for the implementation of this Directive.

Article 5 General provision

The employer shall have a duty to ensure the safety and health of workers in every aspect related to the work.

Article 6 General obligations on employers

The employer shall take the measures necessary for the safety and health protection of workers, including prevention of occupational risks and provision of information and training, as well as provision of the necessary organization and means. The employer shall implement these measures on the basis of defined general principles of prevention including

- avoiding risks;
- evaluating the risks which cannot be avoided;
- combating the risks at source;
- adapting the work to the individual and technical progress;
- replacing the dangerous by the non-dangerous or the less dangerous;
- developing a coherent overall prevention policy
- giving appropriate instructions to the workers.

The employer shall evaluate the risks to the safety and health of workers and their capabilities and implement the preventive measures and working methods which improve the level of protection afforded to workers with regard to safety and health.

Article 7 Protective and preventive services

The employer shall designate one or more workers to carry out activities related to the protection and prevention of occupational risks for the undertaking and/or establishment.

Article 8 First aid, fire-fighting and evacuation of workers, serious and imminent danger

The employer shall take the necessary measures for first aid, fire-fighting and evacuation of workers and other persons present adapted to the nature of the activities and the size of the undertaking

Article 9 Various obligations on employers

The employer shall

- be in possession of an assessment of the risks, including those of a particular nature, to safety and health at work,
- shall decide on the protective measures to be taken and, if necessary, the protective equipment to be used,
- shall keep a list of occupational accidents resulting in a worker being unfit for work for more than three working days,
- draw up, for the responsible authorities and in accordance with national laws and/or practices, reports on occupational accidents suffered by his workers.

Article 10 Worker information

The employer shall take appropriate measures so that workers and/or their representatives, and other persons engaged in work, receive all the necessary information concerning the safety and health risks and protective and preventive measures and activities in respect of both the undertaking in general and each type of workstation and/or job.

The employer shall take appropriate measures so that workers and/or their representatives, with specific functions in protecting the safety and health of workers, shall have access to:

- the risk assessment and protective measures, and the list and reports referred to in Article 9
- the information yielded by protective and preventive measures, inspection agencies and bodies responsible for safety and health.

Article 11 Consultation and participation of workers

Employers shall consult workers and/or their representatives and allow them to take part in discussions on all questions relating to safety and health at work.

Article 12 Training of workers

The employer shall ensure that each worker receives adequate safety and health training, in particular in the form of information and instructions specific to his workstation or job.

Article 13 Workers' Obligations

It shall be the responsibility of each worker to take care as far as possible of his own safety and health and that of other persons affected by his acts in accordance with his training and the instructions given by his employer.

Article 14 Health surveillance

Measures shall be introduced to ensure that workers receive health surveillance, which may be provided as part of a national health system, appropriate to the health and safety risks they incur at work.

Article 15 Risk groups

Particularly sensitive risk groups must be protected against the dangers which specifically affect them.

Article 16 Individual Directives

The Council, acting in accordance with Article 118a of the Treaty, shall adopt individual Directives, including the areas listed in the Annex.

Article 17 Committee

For the purely technical adjustments to the individual Directives, to take account of the adoption of Directives in the field of technical harmonization and standardization, the Commission shall be assisted by a committee composed of the representatives of the Member States.

Article 18 Final provisions

Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive by 31 December 1992, shall inform the Commission thereof and communicate to the Commission the texts of the provisions of national law which they have already adopted or adopt in the field covered by this Directive.

ANNEX List of areas referred to in Article 16

- Work places
- Work equipment
- Personal protective equipment
- Work with visual display units
- Handling of heavy loads involving risk of back injury
- Temporary or mobile work sites

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3 EN ISO STANDARDS

3.1 Safety of Concrete Machinery

The associated directive concerning safety is the **Machinery Directive 89/392**. The EC has given the mandate to CEN to produce a series of CEN Standards covering the safety of machinery to support the essential requirements of this EC directive. The CEN/TC 151 Committee was formed to cover all Construction Equipment and Building Materials Machines - Safety, the secretariat of which is DIN.

Working Groups were established for each category, with WG8 covering Concrete Preparation and Handling Equipment, the secretariat of which is the German machinery association VDMA in Frankfurt.

CEN/TC 151 WG8 has worked on four draft safety standards for

- prEN 12151** *Machinery and Plant for the Preparation of Concrete and Mortar
- Safety Requirements*
- prEN 12609** *Truck Mixers - Safety Requirements*
- prEN 12001** *Conveying, Spraying and Distribution Machines for Concrete and Mortar
- Safety Requirements*
- prEN 12649** *Concrete Compactors and Floating Machines - Safety Requirements*

The standards prEN 12001, prEN 12151 and prEN 12609, are CEN Type C standards covering the hazards specific to these group of machines in comparison with Type A and B standards which cover hazards applicable to all mechanical, electrical, hydraulic and other equipment.

All machines, covered by these standards and manufactured after 1995, must have a CE Mark and declaration of conformity by the manufacturer that they comply with the standard.

For ready mixed concrete companies who manufacture their own plant and equipment, it would seem prudent that they should check the machinery against the requirements of these standards and record their own declaration of conformity before it is used. Risk assessments should be made in accordance with EN 1050 and the following steps taken

- 1 the risk must be removed by designing out the hazard
- 2 If the hazard cannot be designed out, protection must be provided
- 3 If this protection is not possible, adequate warnings must be given.

The standards prEN 12151, prEN 12609, prEN 12001 and prEN 12649 have all completed the CEN Public Enquiry stage and the comments received are now being considered by the respective working groups.

(NOTE: Situation to be updated by Michael Horner)

3.2 Management Systems

EN ISO Standards for management systems have been established for Quality and Environment as follows:

- EN ISO 9000: Quality systems
- EN ISO 9001: 1994 Specification for design/development, production, installation and servicing
- EN ISO 14000: Environmental management systems
- EN ISO 14001:1996 Environmental management systems - Specification with guidance for use

Also relevant are

- EN 30011 Guide to quality systems auditing
- EN 30011 - 1: 1993 Auditing
- EN 30011 - 2: 1993 Qualification criteria for auditors
- EN 30011 - 3: 1993 Managing an audit programme

ISO 9001 is currently under revision and will be available towards the end of 2000. The major reasons for the year 2000 revisions of the ISO 9000 series standards include emphasizing the need to measure customer satisfaction, meeting the need for more user-friendly documents, assuring consistency between quality management system requirements and guidelines, and incorporating generic quality management principles into organizations.

The revised standards should have increased compatibility with the ISO 14000 series of Environmental Management Systems standards.

As yet, there is not an EN ISO standard for Occupational Health and Safety Management Systems although there have been proposals that EN ISO 14001 environmental management systems should be extended to cover Healthy and Safety. In the UK, the British Standards Institute has published BS 8800:1996 Guide to Occupational Health and Safety Management Systems which gives guidance to those organisations who wish base their OH&S management systems on EN ISO 14001 (see Section 4).

It seems highly probable that within the next decade, management systems, auditing and certification schemes will become integrated into one compatible system for Quality, Environment and Health and Safety.

ERMCO GUIDE ON OCCUPATIONAL HEALTH AND SAFETY AT THE WORKPLACE

4 OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEMS

4.1 Introduction

In all developed countries, a comprehensive legal framework already exists for occupational health and safety, requiring organizations to manage their activities in such a way as to anticipate and prevent circumstances that may result in occupational injury or ill-health. The standard BS 8800: 1996 Guide to Occupational Health and Safety Management Systems seeks to improve the occupational health and safety performance of organizations by providing guidance on how the management of OH&S may be integrated with the management of other aspects of business performance, in order to:

- a) **minimize risk to employees and others;**
- b) **improve business performance; and**
- c) **assist organizations to establish a responsible image within the marketplace.**

This standard shares common management system principles with the EN ISO 9000 Quality management' series and the EN ISO 14000 Environmental management series.

All the stages in Figure 1 form part of a cycle for continual improvement of OH&S management and its integration within the overall management system.

Small organizations need to appreciate that while the general principles discussed in the annexes to BS 8800: 1996 apply to all organizations, they will have to be selective as to the aspects that apply immediately to them. Small organizations first need to ensure that they meet legal requirements before aiming for continual improvement over time.

4.2 Scope

BS 8800: 1996 gives guidance on:

- a) the development of occupational health and safety (OH&S) management systems;
- b) the links with other management systems standards.

The guide is designed for use by organizations of all sizes and regardless of the nature of their activities. It is intended that its application will be proportional to the circumstances and needs of the particular organization.

4.3. Definitions

For the purposes of the Guide, the following definitions apply.

4.3.1 accident

Unplanned event giving rise to death, *ill-health* (see 3.8), injury, damage or other loss.

4.3.2 audit

A systematic and, wherever possible, independent examination to determine whether activities and related results conform to planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve the organization's policy and *objectives* (see 3.6).

NOTE. The word 'independent' here does not necessarily mean external to the organization.

4.3.3 external factors

Forces outside the control of the organization that impinge on health and safety issues and need to be taken account of within an appropriate time frame, e.g. regulations, industry standards.

4.3.4 hazard

A source or a situation with a potential for harm in terms of human injury or *ill-health* (see 3.8), damage to property, damage to the environment, or a combination of these

4.3.5 hazard identification

The process of recognising that a *hazard* (see 3.4) exists and defining its characteristics.

4.3.6 health and safety objectives

The goals, in terms of OH&S performance, that an organization sets itself to achieve and which should be quantified wherever practicable.

4.3.7 health surveillance

Monitoring the health of people to detect signs or symptoms of work related *ill-health* (see 3.8) so that steps can be taken to eliminate, or reduce, the probability of further damage.

4.3.8 ill-health (occupational ill-health)

Ill-health that is judged to have been caused by or made worse by a person's work activity or environment.

4.3.9 incident

Unplanned event, which has the potential to lead to *accident* (see 3.1).

4.3.10 internal factors

Forces within the organization that may affect its ability to deliver the health and safety policy, e.g. internal re-organization, culture.

4.3.11 management system

A composite, at any level of complexity, of personnel, resources, policies and procedures, the components of which interact in an organized way to ensure a given task is performed, or to achieve or maintain a specified outcome.

4.3.12 organization

A company, operation, firm, enterprise, institution, or association, or part thereof, whether incorporated or not, public or private, that has its own functions and administration. For organizations with more than one operating unit, a single operating unit may be defined as an organization.

4.3.13 risk

The combination of the likelihood and consequence of a specified hazardous event occurring.

4.3.14 risk assessment

The overall process of estimating the magnitude of risk and deciding whether or not the risk is tolerable or acceptable.

4.3.15 status review

The formal evaluation of the OH&S management system.

4.3.16 target

A detailed performance requirement, quantified wherever practicable, pertaining to the organization, that arises from the *health and safety objectives* (see 3.6) and that needs to be met in order to achieve those objectives.

4.4.0 Introduction

4.4.0.1 General

All the elements of the guide should be incorporated into the OH&S management system, but the manner and extent to which individual elements should be applied will depend on such factors as the size of the organization, the nature of its activities, the hazards and the conditions in which it operates.

4.4.0.2 Initial status review

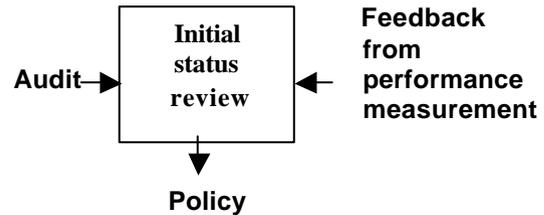
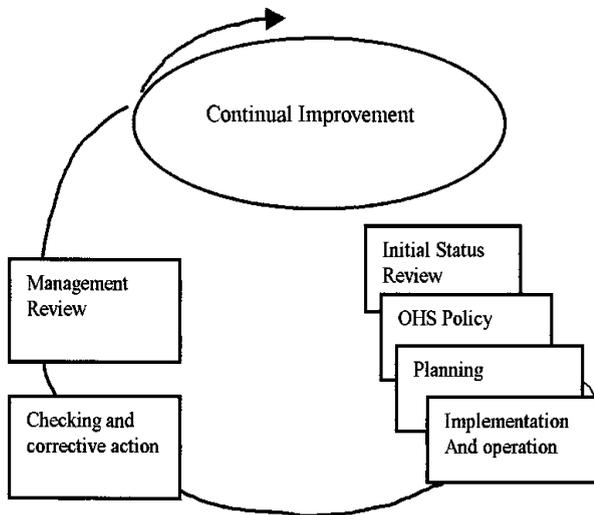


Figure 1. Elements of successful health and safety management based on the approach in BS EN ISO 14001



Organizations should consider carrying out an initial review of their existing arrangements for managing OH&S. This review should be made in order to provide information that will influence decisions on the scope, adequacy and implementation of the current system as well as providing a baseline from which progress can be measured. Initial status reviews should answer the question "where are we now?"

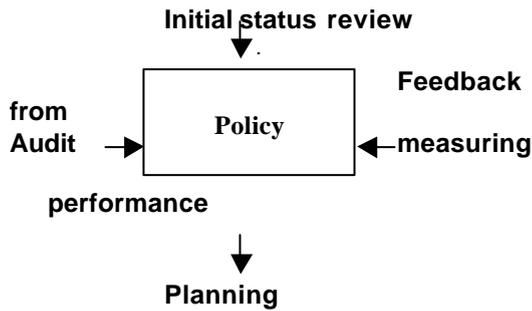
The review should compare the existing arrangements with:

- requirements of relevant legislation dealing with OH&S management issues;
- existing guidance on OH&S management available within the organization;
- best practice and performance in the organizations employment sector and other appropriate sectors (e.g. from relevant HSC industry advisory committees and trade association guidelines);
- efficiency and effectiveness of existing resources devoted to OH&S management.

A useful starting point would be to review the existing system against these guidelines. The annexes provide information to help organizations ensure coverage of key activities. The information from the initial status review may be used in the planning process.

4.4 OH&S management system elements

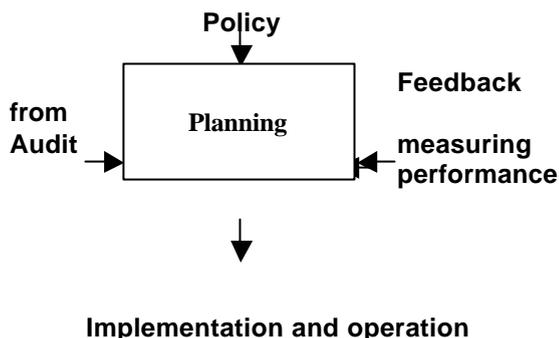
4.4.1 OH&S policy



The organization's most senior management should define, document and endorse its OH&S policy. Management should ensure that the policy includes a commitment to

- a) recognizing OH&S as an integral part of its business performance;
- b) achieving a high level of OH&S performance, with compliance to legal requirements as the minimum, and to continual cost-effective improvement in performance;
- c) provide adequate and appropriate resources to implement the policy;
- d) the setting and publishing of OH&S objectives, even if only by internal notification;
- e) place the management of OH&S as a prime responsibility of line management, from most senior executive to first-line supervisory level;
- f) ensure its understanding, implementation and maintenance at all levels in the organization;
- g) employee involvement and consultation to gain commitment to the policy and its implementation;
- h) periodic review of the policy, the management system and audit of compliance to policy;
- i) ensure that employees at all levels receive appropriate training and are competent to carry out their duties and responsibilities.

4.4.2 Planning



4.4.2.1 General

It is important that success or failure of the planned activity can be clearly seen. This involves identifying OH&S requirements, setting clear performance criteria defining what is to be done, who is responsible, when it is to be done and the desired outcome.

While it is recognized that in practice, organizing, planning and implementing functions will overlap, nevertheless, the following key areas need to be addressed.

4.4.2.2 Risk assessment

The organization should carry out risk assessment including identification of hazards.

4.4.2.3 Legal and other requirements

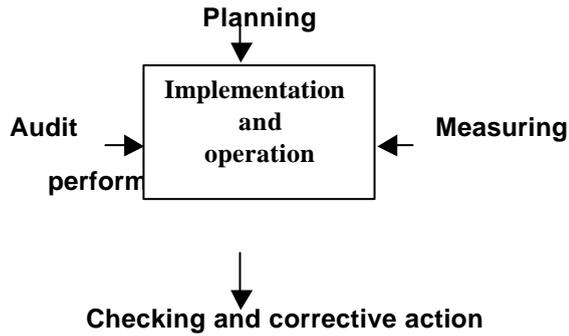
The organization should identify the legal requirements, in addition to the risk assessment, applicable to it and also any other requirements to which it subscribes applicable to OH&S management.

4.4.2.4 OH&S management arrangements

The organization should make arrangements to cover the following key areas:

- a) overall plans and objectives, including personnel and resources, for the organization to achieve its policy;
- b) have or have access to sufficient OH&S knowledge, skills and experience to manage its activities safely and in accordance with legal requirements;
- c) operational plans to implement arrangements to control risks identified in 4.4.2.2 and to meet the requirements identified in 4.4.2.3;
- d) planning for operational control activities covered in 4.4.3.6;
- e) planning for performance measurement, corrective action, audits and management reviews (see 4.4.4.1, 4.4.4.2, 4.4.4.4 and 4.4.5);
- f) implementing corrective actions shown to be necessary.

4.4.3 Implementation and operation



4.4.3.1 Structure and responsibility

Ultimate responsibility for occupational health and safety rests with top management. Here, best practice is to allocate to a person at the most senior management level (e.g. in a large organization, a Board or executive committee member) particular responsibility for ensuring that the OH&S management system is properly implemented and performing to requirements in all locations and spheres of operation within the organization.

At all levels of the organization, people need to be:

- a) responsible for the health and safety of those they manage, themselves and others with whom they work;
- b) aware of their responsibility for the health and safety of people who may be affected by the activities they control, e.g. contractors, public;
- c) aware of the influence that their action or inaction can have on the effectiveness of the OH&S management system.

Senior management should demonstrate, by example, their commitment by being actively involved in the continual improvement of OH&S performance.

4.4.3.2 Training, awareness and competence

The organization should make arrangements to identify the competencies required, at all levels within the organization, and organize any necessary training.

4.4.3.3 Communications

The organization should establish and maintain arrangements, where appropriate, for:

- a) the effective and, open communication of OH&S information;
- b) the provision of specialist advice and services;
- c) employee involvement and consultation.

4.4.3.4 OH&S management system documentation

Documentation is an important element in enabling an organization to implement a successful OH&S management system. It is also important in assembling and retaining OH&S knowledge. But it is important that documentation is kept to the minimum required for effectiveness and efficiency.

Organizations should ensure that sufficient documentation is available to enable OH&S plans to be fully implemented and is proportional to their needs.

4.4.3.5 Document control

Organizations should make arrangements to ensure that documents are up to date and applicable to the purpose for which they are intended.

4.4.3.6 Operational control

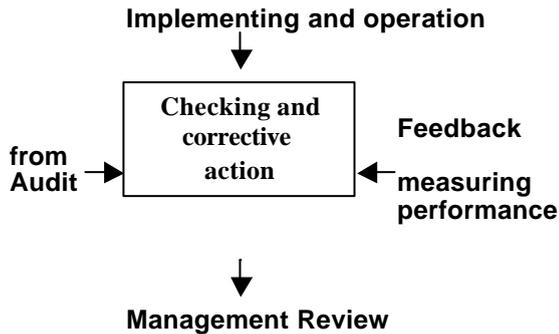
It is important that OH&S, in its broadest sense, is fully integrated across the organization and into all its activities, whatever the size or nature of its work. In organizing for the implementation of the policy and the effective management of OH&S, the organization should make arrangements to ensure that activities are carried out safely and in accordance with arrangements defined in 4.2.4 and should:

- a) define the allocation of responsibilities and accountabilities in the management structure;
- b) ensure people have the necessary authority to carry out their responsibilities;
- c) allocate adequate resources commensurate with its size and nature.

4.4.3.7 Emergency preparedness and response

An organization should make arrangements to establish contingency plans for foreseeable emergencies and to mitigate their effects.

4.4.4 Checking and corrective action



4.4.4.1 Monitoring and measurement

Performance measurement is a key way to provide information on the effectiveness of the OH&S management system. Both qualitative and quantitative measures should be considered where appropriate and should be tailored to the needs of the organization.

Performance measurement is a means of monitoring the extent to which policy and objectives are being met and includes both:

- proactive measures of performance that monitor compliance, for example through surveillance and inspections, with the OH&S arrangements, for example safe systems of work, permits to work, etc.;
- reactive measures of performance that monitor accidents, near misses, ill-health, incidents and other historical evidence of deficient health and safety performance.

4.4.4.2 Corrective action

Where deficiencies are found, root causes should be identified and corrective action taken.

4.4.4.3 Records

The organization should maintain any records necessary to demonstrate compliance with legal and other requirements.

4.4.4.4 Audit

In addition to routine monitoring of occupational health and safety performance, there will be a need for periodic audits that enable a deeper and more critical appraisal of all the elements of the OH&S management system (covered in figure 1). Audits should be conducted by persons who are competent and as independent as possible from the activity that is being audited, but may be drawn from within the organization.

While audits need to be thorough, their approach should be tailored to the size of the organization and the nature of its hazards.

At different times and for different reasons, audits will need to cover the following questions:

- is the organization's overall OH&S management system capable of achieving the required standards of OH&S performance?
- is the organization fulfilling all its obligations with regard to OH&S?
- what are the strengths and weaknesses of the OH&S management system?
- is the organization (or part of it) actually doing and achieving what it claims to do?

Audits may be comprehensive or address selected topics according to circumstance. The results of audits should be communicated to all relevant personnel and corrective action taken as required.

4.4.5 Management review



The organization should define the frequency and scope of periodic reviews of the OH&S management system according to its needs. These reviews should consider:

- the overall performance of the OH&S management system;
- the performance of individual elements of the system;
- the findings of audits;
- internal and external factors, such as changes in organizational structure, legislation pending, the introduction of new technology, etc., and identify what action is necessary to remedy any deficiencies.

The health and safety management system should be designed to accommodate or adapt to internal and external factors. The management review also provides an opportunity to take a forward look. The information in (a) to (d) above can be used by the organization to improve the organization's pro-active approach to minimizing risk, and improve business performance.

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5 HAZARDS AND SAFETY MEASURES IN THE READY MIXED CONCRETE INDUSTRY

5.1 Assessment of the Risks to Safety and Health at Work

Risk assessment is the first step to making workplaces safe and healthy. Every employer has a duty to identify and assess significant risks in the workplace in a systematic way and then take steps to control them or reduce them to insignificant levels.

The potential risks in the various workplaces in the operation of a typical ready mixed concrete plant are given in Section 5.8 together with examples of typical safety requirements and preventive measures.

The Machinery Standard EN 292 lists hazards (i.e. sources of dangers) in the different categories of mechanical, electrical, thermal, noise, vibration, etc. The Safety Requirements Standards for concrete preparation and handling equipment (prEN 12151 "Machinery and Plant for the Preparation of Concrete and Mortar"; prEN 12609 "Truck Mixers"; prEN 12001 "Conveying, Spraying and Distribution Machines for Concrete and Mortar") identify the risks (i.e. the exposure to dangers) which are significant for the particular machinery and which require preventive action to eliminate or reduce the risk.

Risk assessments to identify hazards must be conducted by competent persons appointed by the employer. Their preliminary report is then evaluated by a management team of supervisors and safety representatives who analyse each hazard in terms of its likelihood for causing harm and potential for serious injury. A risk-rating scale is used to help decide which hazards are a top priority.

Suitable control measures are evaluated and methods to reduce risks to insignificant levels are analysed. The assessment is recorded and becomes part of the company's safety and health policy. Action is taken where necessary to introduce new controls or improve existing ones (see *ERMCO Guidelines for Preparing a Safety Audit Check-list for Production and Delivery of Ready Mixed Concrete*).

5.2 Provision of Information on the Safety and Health Risks

After any risk assessment, it is the responsibility of the employer to inform the staff involved of any hazards which have been identified, what action is being taken to control risks and whether any special training is needed.

The information to be provided includes assessment of risk, preventive measures required and being taken, any first aid and fire fighting procedures necessary.

Depending on the nature and severity of the safety and health risk, the required information could be transmitted to staff by circular letter, posters on notice boards, handbooks or specific additional training.

5.3 Consultation of Workers on matters concerning their Safety and Health

Proper safety and health of workers at their workplace can only be achieved through the joint efforts of both the employers and workers. Many employers appoint safety officers or individual staff who are responsible for safety and first aid in a particular workplace. Their task is to ensure that all workers are fully informed of the specific safety and control measures which apply in that workplace.

In turn, these staff safety representatives are in an ideal position to obtain the views of their colleagues on safety and health matters for passing back at safety meetings with the management which should be held at regular intervals.

5.4 Adequate and Job-specific Safety and Health Training for all Workers

Employers are responsible for providing safety and health training for all workers but the extent of this will depend on the nature of the work involved. Some employers operate a two stage training process

in which all personnel receive a general introduction to the company's safety and health policy and procedures including first aid, fire fighting and emergency evacuation routes.

Then, in addition, those with specific tasks involving, say, hazardous substances, manual handling, special equipment, personal protective equipment, noisy environments or VDU screens, will receive additional job-specific guidance and training.

5.5 Obligation of each Worker to take Care

It is the duty of all workers to

- co-operate with their employer on all work and safety procedures
- inform their supervisor of any concerns on safety and health matters
- follow all work and safety procedures and make correct use of machinery, dangerous substances, personal protective equipment etc.

5.6 Safety and Health Performance

A suitable Occupational Health and Safety Management System (see Section 4) should be adopted to assess the extent to which the requirements of the health and safety Directives have been implemented, and satisfactory levels achieved for the prevention of occupational risks, protection of safety and health, and the elimination of risk and accident factors.

5.7 Risk Assessment, Hazards and Safety Measures

5.7.1 Risk Assessment Index

To aid in the assessment of the hazards associated with the operation of machinery, plant and equipment, a risk assessment index can be used to quantify the severity (indicated by a letter) and the frequency (indicated by a number).

| Severity | Frequency |
|---|---|
| (C) Catastrophic - may cause death | (1) often, e.g. once per day or more |
| (S) Severe - may cause severe injury or occupational illness | (2) irregular, e.g. weekly but less than daily |
| (M) Mild - may cause minor injury or occupational illness | (3) occasional, regularity not predictable |
| (N) Negligible - will not result in injury or occupational illness | (4) unlikely |

For example the hazard of a person gaining access to the interior of a large concrete mixer would have a Risk Index of C 1, with risk of severity C because death could result, and frequency quantified as 1 as access may be required more than once per day.

5.7.2 List of Hazards

The Safety Requirements Standards for concrete preparation and handling equipment (prEN 12151 "Machinery and Plant for the Preparation of Concrete and Mortar"; prEN 12609 "Truck Mixers"; prEN 12001 "Conveying, Spraying and Distribution Machines for Concrete and Mortar") provide lists of all hazards, identified by risk assessments significant for the different types of machinery, and which might require action to eliminate or reduce risk. The list of hazards for each type of machinery is categorised into the following groups in accordance with EN 292-1 Safety of Machinery

Mechanical Hazards

- Crushing
- Shearing
- Cutting and severing
- Entanglement
- Entrapment
- Impact
- Stabbing or puncture
- Friction or abrasion
- High pressure fluid injection
- Ejection of parts or material
- Loss of stability
- Slip, trip and falls

Electrical Hazards

Thermal Hazards

Hazards generated by Noise

Hazards generated by Vibration

Hazards generated by Radiation

Ergonomics

Combined Hazards

System failure

5.7.3 Safety Requirements and Measures

The Safety Requirements Standards for concrete preparation and handling machinery then define the common requirements for all machines covered by the Standard, followed by the specific requirements relating to the different types of machines.

For the specific requirements, the safety measures required for minimizing the hazards caused by the different machinery parts are specified in detail for each of the hazard groups.

Some examples of the hazards on a typical ready mixed concrete plant, and the recommended safety measures to minimize these, are given in Section 5.8

It is emphasized that a specific list of hazards, and the safety measures which have been taken, should be drawn up for the machinery, plant and equipment used for each ready mixed concrete operation.

5.8 Examples of Hazards and Safety Measures in the Operation of a Ready Mixed Concrete Plant

| OPERATION | HAZARD | EXAMPLES OF SAFETY MEASURES |
|--|---|--|
| 1 Ground Aggregate Storage | Trucks, loaders reversing Production of dust | Reversing klaxons on all vehicles Control of traffic routes Paving for all plant area Regular wash down with water hose Water sprinkler systems |
| 2 Aggregate Loading Hoppers | Falls into hoppers Blocking of aggregate feeder Production of dust and noise | Barriers around hoppers Grid or grille over hoppers Vibrators to ensure free flow of material Covers to hoppers with strip curtains over loading access |
| 3 Aggregate Belt Conveyors and Feeders | Trapping between conveyor belts in motion and head/tail drums Falling from upper parts of belt Impacts from lower parts of moving belts Production of dust and noise | Protection of tail and head drums, moving parts. Warning signs not to work on belts in motion Operating controls accessible from seat of loading shovel Single switch operation of belts and conveyors Safety handrails along all walkways Grooved or perforated anti-slip floors to walkways Use of firmly attached safety belts during maintenance Trays/pans to catch material falling from belts Protective covers on undersides of conveyor belts Emergency stop lines along length of conveyor belts Protective covering to conveyors to minimise dust |
| 4 Aggregate Distribution Storage Hoppers and Weigh Belts | Falls into hoppers Falls from height during maintenance Trapping between conveyor belts in motion and head/tail drums Production of dust and noise | Suitable access, ladders, handrails to upper levels Vibrators on hoppers to avoid obstruction of material Protection of tail and head drums, moving parts Use of safety belts, extending tools for unclogging Clear marking of hoppers visible from control cabin Provision of safety access platform for maintenance Use of wedges to block closing of hopper gates Emergency stop lines around area of conveyor belts Enclosure of aggregate processing area to minimise dust and noise |
| 5 Cementitious Materials Silos | Falls from upper levels when cleaning filters Production of dust Asphyxia when unclogging lower gate from silo Bursting of silos from overpressure during filling | Ladder for access to top of silos with safety rings Upper platform with safety balustrade, raised floor Connecting walkway between upper silos with safety rails Filters for each silo to avoid dust emission Air fluidizer in lower gate to prevent clogging Security valves in silos to prevent excess pressures Operating pressure of delivery tankers limited to national regulations |
| 6 Cement Screw Feeders | Trapping by the endless screw-feeders Falls during repair and maintenance work | Suitable access platform in screw-feeder area Total enclosure of screw-feeder with safety-locked covers |

| OPERATION | HAZARD | EXAMPLES OF SAFETY MEASURES |
|-------------------------------|---|---|
| 7 Material Scales and Loaders | <p>Falls during operation and maintenance Dropping of weights on feet or hands</p> <p>Production of dust</p> | <p>Suitable access platform in material weighing areas</p> <p>Vibrators on hoppers to avoid obstruction of material</p> <p>Enclosure of scales and loaders to avoid dust emission</p> |
| 8 Mixers | <p>Falls during cleaning and maintenance Trapping, amputations by mixing mechanism</p> | <p>Suitable access platform in mixing area</p> <p>Safety locks on mixer operation Warning signs not to work on mixers in motion Automatic mixer stop catches on access hatches Security grids on observation windows to prevent access Protection covers to all moving parts</p> |
| 9 Truck Loading | <p>Production of dust and noise when loading</p> | <p>Enclosure of loading area to reduce dust and noise Strip curtains at entrance to loading area Flexible funnels from concrete hopper into truck drum Atomized water sprays around hopper gate to dampen dust</p> |
| 10 Truck Mixers | <p>Trapping by moving systems and paddles Falls from loading/unloading chute area</p> <p>Traffic accidents</p> <p>Chemical burns from cleaning operations</p> | <p>Protective guards at loading/unloading mouth for safe inspection Folding ladder and platform at loading/unloading mouth</p> <p>Observation of traffic rules when driving on road</p> <p>Protective clothing for hands, eyes, ears, head during cleaning</p> |
| 11 Loading Shovels | <p>Running over Overturning Trapping</p> <p>Falls</p> <p>Fire or explosion</p> <p>Spine injuries</p> | <p>Reversing klaxons and proper lighting on all vehicles Clear, simple safety instructions for operators Shovel to be stopped with scoop on ground and parking brake on Slopes on shovel routes not greater than 30% with kerbs on ramps Access and descent from cabin by short ladders</p> <p>Machine stopped, no smoking during refuelling</p> <p>Security cabin fitted with overturning bar protection No repair and maintenance when shovel working Loaded scoop to be immobilized when manoeuvring Seat with anti-vibration belt to be adjustable for user</p> |
| 12 Control Cabin | <p>Ingress of dust and noise</p> <p>Fire Electrocution</p> <p>Protection from admixtures dispensers</p> | <p>Cabin to be reasonably airtight and soundproof Air conditioned as necessary</p> <p>CO₂ fire extinguisher Electricity wiring diagram for plant displayed in cabin Emergency stop button for all equipment on control panel</p> <p>Admixture dispensers outside cabin with security valves</p> |

| OPERATION | HAZARD | EXAMPLES OF SAFETY MEASURES |
|---------------------------------------|--|--|
| 13 Auxiliary Installations | Electrocutation in the main fuse system Noise from compressor and pumps Trapping in compressor belts Drowning in settlement tanks | Electrical installation in accordance with regulations Compressors and pumps housed in separate brick building Protection to compressor belts Guard rails around settlement tanks Covers to water recycling tanks |
| 14 Electric Installation and Lighting | Electrocutation by direct or indirect contact Burns of electrical origin Fire Impacts from and against object due to poor lighting | Differential circuit-breakers for power and lighting for all facilities Correct grounding of all electrical installations Main switch fixed separately from general board Electric board clearly marked "Electric Risk" Fuses to limit electrical overloading Provide adequate lighting throughout plant, buildings Provide adequate number power points to avoid extension cables |
| 15 Offices and Services | Accident risks usually associated with habitation Fire | Suitable facilities, furnishing for office and changing rooms Warning signs clearly displayed for employees and visitors Dry powder fire extinguisher Hard hats to be worn by employees and visitors in plant area |
| 16 Employees | Lack of information and training on safety and health | Provision of job-specific information on safety and health risks Preventive measures First aid Fire fighting Risk assessment Consultation of employees on safety and health matters |

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6 OCCUPATIONAL ACCIDENTS – LISTS AND REPORTS

6.1 Requirements of Safety and Health Framework Directive 89/391/EEC

Article 9 Various obligations on employers of the framework Directive requires that employers

- shall keep a list of occupational accidents resulting in a worker being unfit for work for more than three working days,
- draw up, for the responsible authorities and in accordance with national laws and/or practices, reports on occupational accidents suffered by his workers.

6.2 Accident Statistics in the European Ready-Mixed Concrete Industry

The Environment Committee has discussed this subject in the past on several occasions with a view to collecting and comparing Accident Statistics and agreeing common criteria for their analysis.

Reports include

| | |
|-------------|--|
| EETG/95/15 | Accident Statistics - Examples from Ireland |
| EETG/95/15A | - Examples from Italy |
| EETG/95/15B | - Examples from Turkey |
| EETG/96/20 | French Criteria for Accident Numbers and their Gravity |

When the preliminary recommendations of the Environment Committee Working Group 2 on Health and Safety were considered by the Environment Committee at its April 1999 in Oslo, the view was expressed that there was an undue emphasis on accidents at work and their causes, at a time when EU Legislation on these had yet to be drafted or clarified.

Nevertheless, accidents or serious incidents to employees on ready mixed concrete plants or delivery trucks is a matter of great concern to managers in the ready mixed concrete industry. Statistics on work accidents in the industry are available from several member countries when required. A recent papers made available to Working Group 2 from SNBPE in France include a summary "Declaration des Accidents du Travail – 1997,1998".

NOTE: The important subject of Occupational Accidents and lists and reports as required by Article 9 of the Safety and Health Framework Directive should be discussed further by the Environment Committee Working Group 2 on Health and Safety.

European Health and Safety Action Programmes

A.1 The European Coal and Steel Community Programmes

Industrial hygiene in the mines

Main subjects of research:

- means of suppressing dust at the coalface and elsewhere
- monitoring of underground conditions in the mines, and
- achieving a better understanding of the links between exposure to dust and pulmonary diseases caused by dust inhalation.

The control of nuisances in steel plants

Main lines of research in atmospheric pollution:

- the collection and or reduction of organic and inorganic emissions of heavy metals and
- the control of dust emanations in the course of different operations on raw materials and slag heaps.

Considerable impact of research on safety in the mining industry

Research has concentrated on:

- identifying the potential risks of new technologies,
- analysis and presentation of data, and
- improving safety consciousness and individual safety procedures

Health protection

Important research has been carried out into the aetiology of silicosis. The work has led certain researchers to study ways and means of treating this disease and 'mixed dust' pneumoconiosis. Basic studies have been carried out in order to determine correlations in X-rays. In addition, numerous problems of every day concern have been addressed, as for example the radiological diagnosis of pneumoconiosis, the early detection of respiratory ailments, epidemiology, the prevention and treatment of chronic bronchitis and emphysema, and the rehabilitation of patients with respiratory diseases.

Ergonomics in the steel industries

A considerable effort has gone into researching and applying the ergonomics contribution to health and safety in the latest designs of continuous casting plants through action-orientated research projects.

Ergonomics in the coal industry

Not untypical here has been the completion of the work to define the ergonomics design parameters for heavy underground mining equipment.

A similar programme of work has also produced the ergonomics design parameters for an extensive range of underground personnel transport systems.

A.2 Earlier Commission Programmes (1978 - 1995)

The Commission has implemented three action programmes on safety and health at work since 1978, which were all the subject of Council resolutions.

The first programme (1978-82) focused principally on the causes of occupational accidents and diseases, protection against dangerous substances, prevention of the hazards and harmful effects associated with machinery and the improvement of human behaviour.

The second programme (1983-87) dealt with such new aspects as training, information, statistics and research, and co-operation with other international bodies such as the ILO and the WHO.

The third action programme (1988-92) was an essential complement to the social aspects of the development of the internal market. The principles used in that programme are still valid today, and form an essential base for the further actions now being developed. It was based on three fundamental concepts:

- the need to push on with improving the safety and health protection of workers on a broad front;
- the obligation to ensure that workers have adequate protection from the risks of work accidents and occupational diseases; and,
- finally, the need to ensure that the competitive pressures of the single market did not jeopardise the safety and health protection of workers.

With these three objectives in mind, the programme was strongly focused on legislation. The Commission's first step was to define the essential principles underlying the main aspects of safety and health at the workplace. **The Safety and Health Framework Directive** was adopted by the Council in 1989 and outlines general principles for the prevention of occupational risks and the protection of safety and health.

A.3 Community Programme 1996 - 2000

The European Union is undergoing a period of profound change. The EU economy is becoming increasingly knowledge-based. The revolution in information technology is leading to the prospect of a new 'information society' where the possession and transmission of information is assuming ever greater importance.

In order to respond to this changing environment the European Union must adapt its programme of action on health and safety at work. Therefore the 1996-2000 programme aims to be both innovative and forward-looking.

The objective of the Commission's policy in the field of health and safety at work remains the same as over the past 30 years: to reduce to a minimum both work accidents and occupational diseases. However, despite the considerable progress made, both the number of work accidents and the incidence of occupational diseases are too high. It has been estimated that there are approximately 4,8 million accidents at work in Europe each year and almost 6.000 accidents resulting in death. In addition to a huge cost in terms of human suffering, it also represents a huge cost in economic terms.

As a result of various studies carried out it is estimated that industrial accidents and work-related ill-health cost the national economies between 1,5 to 4% of GDP. Where as in the past the main focus of EU action on health and safety at work, has been legislative, the programme 1996-2000 provides a much greater emphasis on information. This is necessary to ensure that the substantial body of EU health and safety legislation in place is correctly and effectively enforced. In addition, the programme assumes the following basic principles:

- Better health and safety standards will strengthen competitiveness. The Commission considers that measures aimed at reducing the costs of ill-health and accidents can all play their part in the development of an efficient, competitive, quality-based economy.
- Existing legislation on health and safety will be better enforced. The Commission aims to ensure that the Member States fulfil their obligations and transpose accurately and on time the Community health and safety directives. Otherwise the effectiveness of this legislation will be impaired and safety standards will be damaged.
- New risks and hazards may require new legislation. The Commission will be undertaking investigations to evaluate the health and safety implications of new developments and the appropriate response.
- The social dialogue will remain central to the development of policy. Successful action on health and safety can only be achieved with the joint support of the social partners. The policy of their consultation will continue under the programme 1996-2000.

SUMMARIES OF EC DIRECTIVES CONCERNING OCCUPATIONAL HEALTH AND SAFETY

B.1 Measures to Encourage Improvements in the Safety and Health of Workers at Work Council Directive **89/391/EEC** of 12 June 1989

The fundamental framework Directive creates the basis for all subsequent directives concerning the safety and health of workers at work. It requires many Member States to introduce fundamental changes to their legislation regarding the duties of employers to protect the health and safety of workers.

This Directive requires the employer to bear the duty to ensure the safety and health of workers in every aspect related to the work including

- an **assessment of the risks** to the safety and health at work
- the provision of **information on the safety and health risks**, preventive measures, first aid, fire fighting, the risk assessment
- **consultation of workers** on matters concerning their safety and health
- ensuring that each worker receives **adequate and job-specific** safety and **health training**

In turn, each worker has an **obligation to take care** of his/her own safety and health and to make correct use of machinery, dangerous substances, personal protective equipment etc.

The Member States were required to transpose this Directive into their national legislation by 31 December 1992. The individual directives most relevant to the ready mixed concrete industry include the following.

B.2 Minimum Safety and Health Requirements for the Use of Work Equipment by Workers at Work Council Directive **89/655/EEC** 30.11.89 (second individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC)

The objective of this directive is to guarantee a better standard of safety and health for workers in the use of work equipment. The employer must base the choice of work equipment on the specific working conditions and hazards existing for workers in order to eliminate or minimize those hazards. Where it is not possible to use work equipment which does not jeopardize the health and safety of workers, the employer must minimize the risks.

The employer must provide adequate instruction and training in the use of work equipment for the workers. Use, maintenance or repair of work equipment involving a specific risk may only be carried out by workers specifically designated for the task.

The Member States were required to transpose the Directive into their national legislation by 31 December 1992. Equipment made available for workers for the first time after this date must comply with the requirements of the Annex; work equipment already in use on 31 December 1992 must have done so no later than four years after that date ie by the end of 1996.

B.3 Minimum Safety and Health Requirements for the Use by Workers of Personal Protective Equipment at the Workplace Council Directive **89/656/EEC** 30.11.89 (third individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC)

The objective of this directive is to guarantee greater health and safety for workers through the use of personal protective equipment. Personal protective equipment is defined as all equipment, including any addition or accessory, designed to be worn or held by the worker to protect him/her against one or more hazards likely to endanger his/her safety and health at work.

The use of personal protective equipment is required when risks cannot be avoided or limited by technical means, methods or procedures of work organization. Personal protective equipment must comply with the relevant Community provisions on design and manufacture.

All personal protective equipment must be appropriate for the risks involved, without leading to any increased risk. It must correspond to the existing conditions at the workplace and it must fit the wearer correctly. The employer must provide the personal protective equipment and pay any expense in connection therewith and must ensure that it is in good working order and hygienic condition.

Training and the organization of demonstrations in the wearing of the personal protective equipment also lie with the employer. Member States were required to transpose this Directive into their national legislation by 31 December 1992.

B.3.1 Types of personal protective equipment

In addition to a survey table for the use of personal protective equipment, the Annexes to the Directive list examples of personal protective equipment intended for protection of the head, hearing, the eyes and face, the respiratory system, hands and arms, feet and legs, the skin, etc. Furthermore, the Annexes provide examples of activities and sectors which may require the use of such equipment, eg building work, scaffolding work, furnace construction, roof work, work with pneumatic drills and welding.

For implementation of the Directive, the Commission has published a Communication concerning the assessment of the safety aspects of personal protective equipment with a view to the choice and use thereof.

B.4 Minimum Safety and Health Requirements for the Manual Handling of Loads where there is a particular risk of back injury to Workers Council Directive **90/269/EEC** 20.05.90 (fourth individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC)

The objective of this directive is to lay down the minimum health and safety requirements for the manual handling of loads where there is a risk particularly of back injury to workers. Manual handling of loads is defined as any transporting of a load, including lifting, putting down, pushing, pulling carrying or moving a load which involves a particular risk of back injury to workers.

The employer must try to avoid the need for manual handling of loads by workers. He must therefore take appropriate organizational measures or make use of, for instance, mechanical equipment. Where manual handling cannot be avoided, the employer must try to reduce the risks involved. It is also the employer's duty to inform the workers of the weight of the load to be carried and the centre of gravity of the heaviest side of a load, and the risks involved in incorrect handling.

The Annexes of this directive list factors which are to be used to estimate if there is a general or individual risk to the worker. A load, for example, may present a particular risk of back injury if it is difficult to grasp or unstable, and the activity may present a risk if it is over-frequent or does not permit sufficient bodily rest.

Member States were required to transpose this Directive into their national legislation by 31 December 1992.

B.5 Minimum Requirements for the Provision of Safety and/or Health signs at Work Council Directive **92/58/EEC** 24.06.92 (ninth Individual Directive within the meaning of Directive 89/391/EEC).

The objective of this directive is to redraft Directive 77/576/EEC, extend its scope, and strengthen some of its provisions. Furthermore, to introduce new signboards and other types of safety signs. An additional aim is to reduce the risks arising from linguistic and cultural differences resulting from the free movement of workers. The use of signs is compulsory under certain conditions.

Signs must be provided where there are risks or dangers which have not been eliminated or adequately limited by preventive measures. Where appropriate, signs used for road, rail, inland waterway, sea and air transport must be installed on the premises of undertakings.

The Directive covers signs for the location and identification of containers and pipes and of fire-fighting equipment, markings for traffic routes, luminous and acoustic signs, verbal communication and hand signals. The Annexes to the Directive list the types of signs and the conditions of use.

In some cases, Member States may grant exempt from the obligation to use certain signs. Member States were required to transpose the Directive into their national legislation by 24 June 1994.

B.6 Supplementing the Measures to encourage Improvements in the Safety and Health of Workers at Work with Fixed-duration Employment or Temporary Employment Council Directive **91/383/EEC** 25.06.1991

Employment of temporary workers has accelerated considerably. Furthermore temporary workers are, in certain sectors, exposed to a higher risk of occupational accidents and diseases. Therefore, it is necessary to have supplementary provisions for their protection. Workers of this kind should have the same level of protection as other workers.

Fixed-duration employment is defined as a relationship of employment agreed directly between the employer and the worker where the end of the contract is established by objective conditions. In temporary employment, the temporary employment agency is the employer and the worker is put at the disposal of a user enterprise.

It is essential that the temporary worker is informed and trained on the kind of work to be performed. In the case of temporary employment, it rests with the employment agency to provide the worker with adequate information.

Member States may forbid certain forms of work to be carried out by a temporary worker if it is especially dangerous or requires special medical supervision. Member States were required to transpose the Directive into their national legislation by 31 December 1992.

Protection of Workers from Harmful Agents

The following three Directives and proposals on the Protection of Workers from the Risks related to Exposure to Chemical, Physical and Biological Agents (Draft Council Directives 88/642/EEC, 93/C77/02, 93/C165/04) have been developed in parallel.

B.7 Protection of Workers from the Risks related to Exposure to Chemical, Physical and Biological Agents at Work Council Directive **88/642/EEC** 16.12.88 (amending Directive 80/1107/EEC)

B.8 Minimum Health and Safety Requirements regarding the Exposure of Workers to the Risks arising from Physical Agents Proposal for Council Directive **93/C77/02** Document COM(92) 560 Final - SYN449 Submitted by the Commission on 8 February 1993.

The proposal in 93/C77/02 to reduce the first action level on noise from 85dBA to 80dBA could have implications for the ready mixed concrete industry if, and when, this is introduced. The implementation of this proposed Directive appears to have been deferred.

B.9 Protection of the Health and Safety of Workers from the Risks related to Chemical Agents at Work Council Directive **98/24/04/EC** 07.04.1998 (fourteenth Individual Directive within the meaning of Directive 89/391/EEC).

This recently implemented Directive supersedes some aspects of the earlier Directive 80/1107/EEC. It defines 'chemical agent', 'hazardous chemical agent' and binding biological occupational exposure limit (OEL) values for metallic lead and its ionic compounds.

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Council Directive 82/605/EEC 28.07.82 *on the protection of workers from the risks related to exposure to metallic lead and its ionic compounds at work*

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Council Directive 89/654/EEC 30.11.89 *concerning the minimum safety and health requirements for the workplace* (Official Journal L 393 30.12.89 p.1)

Council Directive 89/655/EEC 30.06.89 *concerning the minimum safety and health requirements for the use of work equipment by workers at work* (Official Journal L 393 30.12.89 p.13)

Council Directive 89/392/EEC 14.06.89 *on the approximation of the laws of the Member States relating to machinery* (Official Journal L 183 29.06.89 p.9)

Council Directive 89/656/EEC 30.11.89 *on the minimum safety and health requirements for the use by workers of personal protective equipment at the workplace* (Official Journal L 393 30.12.89 p.18)

Council Directive 90/269/EEC 29.05.90 *on the minimum safety and health requirements for the manual handling of loads where there is a particular risk of back injury to workers* (Official Journal L 156 21.06.90 p.9)

Council Directive 92/58/EEC 24.06.92 *on the minimum requirements for the provision of safety and/or health signs at work* (Official Journal L 245 26.08.92 p.23)

Council Directive 91/383/EEC 25.06.1991 *supplementing the measures to encourage improvements in the safety and health of workers at work with a fixed-duration employment or a temporary employment relationship* (Official Journal L 206 29.07.91 p.19)

Council Directive 80/1107/EEC 27.11.80 (subsequently amended) *on the protection of workers from the risks related to exposure to chemical, physical and biological agents at work* (Official Journal L 356 24.12.88 p.74)

Council Directive 93/C77/02 (Proposal for) *the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents* Document COM(92) 560 Final - SYN449 Submitted by the Commission on 8 February 1993

Council Directive 98/24/EC 07.04.98 *on the protection of the health and safety of workers from the risks related to chemical agents at work* (Official Journal L 131 05.05.98 p.11)

ISO/CEN Standards

ISO 18001 OHSAS:

EN 292-1 *Safety of machinery: Basic concepts, general principles for design as well ISO - Part 1: Basic terminology, methodology*

EN 292-2 *Safety of machinery: Basic concepts, general principles for design as well ISO - Part 2: Technical principles and specifications*

To support the essential requirements of the EC directives, the CEN/TC 151 Committee (WG8 Concrete Preparation and Handling Equipment) is preparing four safety standards for machinery and plant for the preparation of concrete and mortar as follows:

prEN 12151 *Machinery and Plant for the Preparation of Concrete and Mortar*
- Safety Requirements

prEN 12609 *Truck Mixers - Safety Requirements*

prEN 12001 *Conveying, Spraying and Distribution Machines for Concrete and Mortar*
- Safety Requirements

prEN 12649 *Concrete Compactors and Floating Machines - Safety Requirements*

Other References

"Guidelines for Preparing a Safety Audit Check-list for Production and Delivery of Ready Mixed Concrete" ERMCO May 1998

"Evaluation Prevention of Operational Risks on a Ready Mixed Concrete Plant"
ANEFHOP Journal "Hormigon" December 1995

"Guide for the Labour Risks Prevention in a Plant for the Ready Mixed Concrete Production"
Paper presented by N B Calvo at ERMCO '98 Congress, Lisbon, June 1998

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EUROPEAN READY MIXED CONCRETE ORGANIZATION
ASSOCIATION EUROPEENNE DU BETON PRET A L'EMPLOI
EUROPÄISCHER TRANSPORTBETONVERBAND

Rue Volta 8
B 1050 Brussels

Tel: + 32 (2) 6455 212
Fax: + 32 (2) 7351467
e-mail: secretariat@ermco.org