ECI Guide to Managing Health in Construction

European Construction Institute

The ECI guide to managing health in construction

Edited by
Alistair G. F. Gibb, Diane E. Gyi and Trevor Thompson

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Foreword

The European Community has seen in the last decade a wealth of progress with the effective implementation of the Internal Market and the launch of the Euro. Meanwhile, the economy is in a process of globalisation fostered by the rapid development of new communication technology as well as the ensuing introduction of structural and organisational changes.

This technological revolution is associated with a new impetus towards a simplification and rationalisation of legislation at Community level.

As a result of the Single European Act, an important body of modern Community Legislation has now been enacted aimed at improving safety and health across the board, and in particular in high risk activities, such as in construction.

This up-to-date legislation includes a specific directive on safety and health at construction and building sites, and is based on the concept of preventing work accidents and occupational diseases.

It is now increasingly accepted that good conditions of safety and health are also good business. Thus the integration of safety and health measures into a total management system in the construction sector can play as important a role as for example, cost efficiency, quality assurance and environmental protection.

J. R. Biosca de Sagastuy
Head of Unit
Health, safety and hygiene at work
European Commission Directorate-General V
Employment, Industrial Relations and Social Affairs

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Members of the Task Force who contributed to this work are:

Peter Brown	Bechtel Ltd
Ian Burgess	Alstom Automation Ltd
Jean-Luc Dumas	Technip
Susan Fink	Masons Solicitors
Alistair Gibb	Loughborough University
Roy Greenslade	AMEC Process & Energy Ltd
Diane Gyi	Loughborough University
Dirk Hessing	ABB Lummus Global BV
Carsten Mink	Lurgi Oel Gas Chemie GmbH
Dave Pearson	BG plc
Keith Rendell	MW Kellogg Ltd
Terry Skinner	National Power plc
Guido Simons	Fluor Daniel Ltd
David Stewart	Foster Wheeler Energy Ltd
Trevor Thompson	Kvaerner Process (UK) Ltd

Other contributors were:

Mahmood Ahmed	BG plc
L. Appleby	Siemens plc
John Asprey	HVCA
Diego Biondo	Technip Italy
Jane Bugler	Marine Contractors Association
Veronique De Bach	Prevent, Belgium
Steve Deacon	M W Kellogg
Mike Disney	ECIA
Steve Dunstan	Nuclear Electric

Gerhard Elsigan	PPM Austria
Anne Enderby	Foster Wheeler Energy Ltd
Gerda Linke-Kaiser	Arbeitsmedizinischer Dienst der Bau-Berufsgenossenschaft Frankfurt am Main
Chris Marchant	Interconnector
Terry Pierce	MW Kellogg Ltd
Mike Totterdell	Fluor Daniel Ltd

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Debbie Weston	ECI
Vera Cole	ECI
Debbie Rickwood	ECI

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The ECI

To learn more about the European Construction Institute (ECI), its members and work, contact the ECI at the address below or visit the ECI website at http://info.lboro.ac.uk/eci

ECI
Arnold Hall Building
Loughborough University
Loughborough
Leicestershire
LE11 3TU

List of abbreviations

AAA	Association d'Assurance contre les Accidents (Luxembourg)
ACOP	Approved Code of Practice (UK)
AEA	Atomic Energy Authority (UK)
AMD	Arbeitsmedizinischer Dienst, AMD (Occupational Health Service) (Germany)
ANACT	Agence Nationale pour l'Amelioration des Conditions de Travail (National Agency for the Improvement of Working Conditions) (France)
At	Arbejdstilsynet (Labour Inspectorate in Denmark)
BMA	Bundesministerium fur Arbet und Sozialordung (Federal Ministry for Labour and Social Affairs) (Germany)
BS	British Standard
CDM Regs	Construction (Design and Management) Regulations (UK)
CIRIA	Construction Industry Research and Information Association (UK)
CITB	Construction Industry Training Board (UK)
CNAM	Caisse Nationale d'Assurance Maladie (National Sickness Insurance Fund) (France)
CONIAC	Construction Industry Advisory Service (UK)
COSHH Regs	Control of Substances Hazardous to Health Regulations (UK)
CPAM	Caisse Primaire d'Assurance Maladie (Primary Sickness Insurance Fund) (France)
CRAM	Caisse Regionale d'Assurance Maladie (Regionale Sickness Insurance Fund) (France)
CSPRP	Conseil Superieur de la Prevention des Risques Professionels (Higher Council for the Prevention of Occupational Hazards) (France)
DCI	Decompression Illness
DSS	Department of Social Security (UK)
ECI	European Construction Institute
EEC	European Economic Community
EMAS	Employment Medical Advisory Service
EU	European Union

GA	Labour Inspectorates, Gewerbeaumfsicht (Germany)
GISBAU	A hazardous material information system (Germany)
HSC	Health & Safety Commission (UK)
HSE	Health & Safety Executive (UK)
HSW Act	Health & Safety at Work Act (UK)
HVAC	Heating, Ventilation & Air Conditioning Contractors Association (UK)
ILO	The International Labour Office (Geneva)
IM	Administration de l'Hygene et de la Medicine du Travel (Austria)
INIAL	Istituto Nazionale per l'assicurazione contro gli infortuni sul lavoro (National Employment Injuries Institute) (Italy)
INSS	Instituto Nacional de la Seguridad Social (National Institute of Social Security) (Spain)
IS	Adminstration de la Securite in (Austria)
ISSA	The International Social Security Association
KYAE	Centre for Health & Safety at Work (Finland)
LAU	Local Authority Unit
MHSW Regs	Management Of Health and Safety at Work Regulations (UK)
MSDS	Material Safety Data Sheet
OHSC	Occupational Health & Safety Centres (The Netherlands)
OPPBTP	Organisme Professional de Prevention du Batiment et des Traveaux Publics (France)
PPE	Personal Protective Equipment
RIDDOR	Reporting of Injuries, Diseases and Dangerous Occurrences (UK)
RSI	Repetitive Strain Injury
SAF	Swedish Employers Confederation
SDTE	Services Deconcentrees du Travail et de L'Emploi (Ministry of Labour and its Inspectorate) (France)
SHE	Safety, Health and Environment
UK	United Kingdom
ULD	Upper Limb Disorder
USL	Unita Sanitarie Locali (Local Health Authority) (Italy)
UVV	Unfallverhutungsvorschriften (Accident Prevention Regulations) (Germany)
VDU	Visual Display Unit
WHO	World Health Organisation

1. Introduction to health management and this manual

Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.

(World Health Organisation 1998)

1.1 Who should read this manual?

This practical guidance manual has been written for site managers, health and safety managers, and other managers with a responsibility or interest in the management of health in the construction industry.

The European Construction Institute (ECI) recognises that there is a fundamental need to examine the extent, causes and management of the problem of occupational ill-health in the construction industry and to improve the health culture. Clients, designers, contractors, other experts and the workers themselves need to be involved. It is a problem for us all to address.

1.2 Why do you need this manual?

1.2.1 Because ill-health is a major problem for the construction industry

Historically, less effort has been directed towards health matters in the construction industry in favour of the more immediate, high profile (and perhaps more easily solvable) problem of safety. Nevertheless, ill-health continues to disable and kill large numbers of construction workers. In fact, the delay in the effects becoming obvious is one of the main reasons why the subject should be taken seriously.

2 million people in the UK suffer from ill-health caused by work:

- *Musculoskeletal disorders (1.2 million people)*
- *Stress (500 K)*
- *Noise (170 K)*
- *Skin diseases (66 K)*
- *Headaches or eyestrain (50 K)*

(Self Reported Work-Related Illness Survey (1995) HSE)

Each year 187 million working days are lost due to ill-health related absence in the UK.

(Confederation of British Industry 1997)

The 2000 largest enterprises in Portugal lost more than 7.7 million working days as a result of illness in 1993. This represents 4.5% of all working days for these companies.

(Gründemann and van Vuuren 1998)

20% of sickness absence among 15 – 66 year-olds in Denmark is caused by the working environment

(Gründemann and van Vuuren 1998)

The UK Government estimates that, by the year 2020, asbestos-related diseases will kill up to 10 000 people each year

(Croner 1998a)

36 000 people in the UK suffer from 'vibration white finger' and over a million are at risk

(HSE 1998)

Dermatitis is becoming the main reason for absence from work in Germany

(Berger 1998)

Cement is believed to cause up to 40% of all cases of occupational dermatitis in the UK

(Beck 1990)

UK and US construction workers have the third highest rate of skin disorders

(Burkhart *et al.* 1993)

1.2.2 Because the cost of worker ill-health is increasing

The real cost to industry due to ill-health in all countries is significant and includes:

- lost production
- insurance
- compensation

- recruitment
- re-training.

In addition there are costs to society that include:

- social security
- health care
- early retirement.

Absence from work through ill-health costs UK industry £12 billion a year

(Confederation of British Industry 1997)

In 1993 German employers paid DM 60 billion (30.5 billion ECU) for the social security insurance of their workers to cover the payments for absence from work

(Gründemann and van Vuuren 1998)

In 1995, Belgium paid 93 billion BFR (2.4 billion ECU) on sickness benefits and 21 billion BFR (0.6 billion ECU) on benefits for work accidents and occupational diseases.

(Gründemann and van Vuuren 1998)

The cost of benefits for sickness absenteeism and disability in The Netherlands in 1993 was 35 billion NLG (16.6 billion ECU)

(Gründemann and van Vuuren 1998)

The socio-economic costs of work-related diseases and accidents in Denmark in 1992 were estimated at between 3 to 3.7 billion ECU, on a working population of 3 million persons.

(Gründemann and van Vuuren 1998)

Prosecutions and litigious court actions on occupational health grounds are now commonplace in countries such as the US and are starting to be seen in Europe as well. The sums of money involved are becoming more and more significant.

A UK health authority has recently settled out of court by paying £70 000 compensation for an office worker who became unable to work due to an upper limb disorder caused by her work inputting computer data

(Anon 1998a)

Musculoskeletal disorders due to poor training and ergonomic design are the leading source of compensation claims in the USA

(Hunting 1994)

A UK damp-proofing operative won £76 000 following developing hand – arm vibration syndrome through prolonged use of heavy hammer action drills between 1972 and 1994

(Anon 1998c)

British Coal was found liable for causing respiratory diseases in six former miners. Estimates of the liability in related cases fall between £50 million and £1 billion.
The judge considered that committed efforts by the employer to control dust should have occurred 20 years earlier

(Anon 1998b)

£185 000 damages were awarded to the widow of a 54 year-old man who died of mesothelioma following workplace exposure to asbestos

(Anon 1997a)

Dermatitis costs the US between $222 million and $1 billion each year

(Rosen and Freeman 1992)

1.2.3 Because employers and managers have a responsibility to manage health risks

Clients and contractors have a statutory and common law duty to develop health risk management systems, which should be based on full and careful appraisal of the health risks to which all their employees (including subcontracted workers) will be exposed.

An employer was fined because no advice or warnings were given despite the fact that the dangers were known about

(Anon 1998c)

1.2.4 Because health management is not easy

The main difficulties voiced by the industry regarding occupational health management include the following.

- Health is a complex issue
- Health traditionally has a low profile compared to safety
- Health management is associated with potentially large set-up costs
- Benefits are not immediate and are consequently difficult to demonstrate
- The latent effect of illness is difficult to quantify
- Exposure to health risks can be multiple with changes in the nature and level
- Long term strategies are required
- The workforce is sizeable, temporary and mobile
- Many workers are not directly employed
- The workers are often not interested, perhaps due to possible loss of livelihood or the endemic 'macho culture' of construction workers
- There is a lack of health expertise within the industry.

No one is claiming that these problems are non-existent, but the industry must rise above the excuses and grasp the opportunity to manage its way out of the mire.

1.2.5 Because a strategic approach to health management will result in benefits

The main aim of health management is to prevent ill-health rather than to cure it.

Effective, strategic management action by senior managers will reduce accidents and incidents leading to injury and ill-health. However, despite this knowledge, construction managers understand their role in safety and the prevention of injury, but are less clear regarding the prevention of ill-health (Gyi *et al.* 1998). This 'reality-gap' must be acknowledged and eradicated.

1.3 How should you use this manual?

The manual should be used as part of an integrated health management strategy that includes the following.

- Setting targets for health improvement
- Implementing risk assessments and control measures

- Monitoring performance
- Informing, instructing and training the workforce
- Applying effective health surveillance
- Improving communications
- Audit then Audit then Audit.

The layout of the manual is as follows.

Chapter 2

This chapter considers occupational health as part of total project management, i.e. from the initial concept stage to de-commissioning, dismantling and demolition. Construction activities are referenced to specific health problems and recommended actions required at each stage of the construction process are provided.

Chapter 3

This chapter addresses common occupational health problems associated with construction tasks and lists the key risk indicators. Guidance is provided regarding their management, in particular covering:

- pre-employment assessment
- practical advice for managers
- signs and symptoms
- preventative or protective measures for workers
- health surveillance.

Examples of good practice ideas, forms, policies and toolbox talks are included. The advice for workers is arranged to enable managers to use it as the basis for briefing sessions.

Chapter 4

Specific control measures for the management of occupational health are suggested. The central role of risk assessment is identified along with a human factors approach to hazard evaluation. The key professionals involved are introduced and practical advice is provided on medicals, health and welfare facilities, training and information, and personal protective equipment. Finally, the important subject of record keeping is discussed. Once again examples from industry leaders are provided.

Chapter 5

The basis of European legislation and how it affects the UK and other Member States is explained. Some of the important health agencies that operate in Europe are listed.

Appendices

Important sources of additional information are identified. Individual member state legislation and organisations for occupational health are summarised in the appendices. This will provide an introduction to the national approach to occupational health for any organisation operating in one of the EU Member States.

2. Strategy to manage health throughout the construction process

2.1 Introduction

Effective management of Safety, Health & Environmental (SHE) issues throughout the project process is essential. This manual concentrates on health management. However, in most cases Safety Health & Environment are managed together as part of an overall SHE strategy. The ECI Manual *Total Project Management of Construction Safety, Health and Environment* (ECI 1995) provides detailed guidance on the actions required by all parties throughout the project. Figure 2.1.1 has been reproduced from the ECI SHE manual and provides the structure for this chapter.

The terms Planning Supervisor and Principal Contractor are used in this section and have been taken from the UK's Construction (Design & Management) Regulations. A brief description of both is given below.

The Planning Supervisor is specifically referred to in the UK Construction (Design & Management) Regulations. A Planning Supervisor is a company, partnership, organisation or an individual who coordinates and manages SHE aspects of design. The Planning Supervisor also has to ensure that the pre-tender SHE Plan and the Health & Safety File are prepared.

The Principal Contractor is specifically referred to in the UK Construction (Design & Management) Regulations. The Principal Contractor is appointed by the client and has overall responsibility for the management of site operations. The responsibility includes the overall coordination of site SHE management.

It should be noted that the Planning Supervisor and the Principal Contractor defined by the UK Regulations fulfil the functions of the Project Supervisors and the Executive Phase Coordinators as defined in the EC Temporary or Mobile Construction Sites Directive. This is discussed further in Appendix 17.

Figure 2.1.1
Project Stages and Key SHE Events

Key Events	Project Stages and Key SHE events	Construction SHE Milestones and Audit Points
Project Purpose and Description Screening Estimates	**CONCEPT** Identification of Major SHE Hazards and Assessment of Risks	Hazcon 1 Start of Audit Trail
Technical Feasibility Study Estimate Economic Analysis	**FEASIBILITY** Confirmation that residual SHE risks can be managed	
Front End Engineering Development of Summary Budget Estimate Commitment Plan Appointment of Planning Supervisor	**FRONT END (SCHEME DESIGN)** Detailed SHE Definition	
Design Basis Design Detail Environmental Information Material Specification Construction Basis	**PROJECT PLAN**	
Contract Strategy	**SPECIFICATION** Establish SHE Requirements	Contract SHE Plan Major Audit point
Completion of Detailed Design	**TENDER** Assessment of SHE Costs	
	EVALUATION Confirmation that the contractor can resource the SHE plan Assessment of Competence of Principal Contractor	Planning Supervisor Major Audit Point
	CONTRACT AWARD Appointment of Principal Contractor	
	PRE CONSTRUCTION PLANNING Project SHE Plan Develop construction details	
Contractors Design Construction Commissioning, Handover, maintenance De-commissioning Demolition	**EXECUTION** Supervision, measurement and control of contractor's SHE performance and monitor SHE plan	Principal Contractor Performance Major Audit Point
FEEDBACK TO ALL STAGES	**REVIEW** Evaluation of SHE management	

In countries where the Planning Supervisor and Principal Contractor are not used the roles described in this section should be fulfilled by the most appropriate organisations. For instance, the Planning Supervisor equivalent may be the organisation managing the design phase and the Principal Contractor may be the major contractor managing the construction phase.

2.2 Health hazard identification

A key principle in the management of SHE is identifying and managing the hazards to control the risk to all parties.

Hazard and risk have been well defined, in terms of health and safety. For example in the UK they are covered in the Control of Substances Hazardous to Health (COSHH) and more recently the Management of Health & Safety at Work (MHSW) Regulations.

2.2.1 Hazard

A hazard is something with the potential to cause harm (including ill-health, physical injury and damage to plant, equipment, property or the environment). It can include substances or machines, methods of work and other aspects of work organisation.

2.2.2 Risk

Risk is the likelihood of the potential for harm. It can be expressed as:

$$\text{Risk} = \text{Hazard Severity} \times \text{Likelihood of Occurrence}$$

A comprehensive health hazard identification and risk assessment of the construction activities should be performed at the earliest opportunity by the client and/or designer. This should be as soon after project conception as is possible. This information then needs to be transferred to the Principal Contractor in the pre-tender SHE Plan.

At both the project conception and pre-tender stages relevant professionals need to be included in the assessment stages. These professionals should include doctors, nurses, hygienists and ergonomists.

2.3 Health management system

Health protection is a line management responsibility with medical professionals and other experts assisting in the development and implementation of the health management programme. The need for and type of medical support on site also needs to be determined. An appropriate health risk management system can then be developed. It is the responsibility of client and contractor management to ensure that appropriate control measures are provided, and their effectiveness evaluated.

The Exploration & Production Forum (E&P Forum 1993) advised that a successful health management system should cover three broad areas:

- Formulating policy and developing the organisation. This includes identifying health objectives and reviewing progress towards their achievement
- Planning, implementing and auditing of health activities and standards
- Performance measurement and reporting.

They also advise that at least the following should be in place:

- Roles defined
- Resources allocated
- Means of achieving objectives specified
- Performance monitored
- Specific task targets and procedures defined
- Compliance checked.

2.4 Initial concept, feasibility and project objectives

Health risk management is largely devoted to the identification of health hazards that could arise. The client or designer can undertake this assessment, commonly known at this stage of a project as 'Hazcon 1', but the client must take responsibility. The Hazcon approach is described in greater detail in the ECI SHE manual (ECI 1995). The following should be used to aid this assessment:

- Overall project method statement
- Experience gained from previous projects including close out reports
- Similar activities in relevant locations
- Health audits carried out on similar projects
- General background information on planned areas of operation
- Environmental issues
- Major risk factors
- Substances already at site and those that will be taken to site
- Emergency response procedures
- Incident reporting procedures
- Published guidance by enforcing authorities.

The checklist in Figure 2.4.1 is a guide for broad coverage of items which could affect an employee's health.

Figure 2.4.1
Factors affecting workers' health

Physical	Chemical	Biological	Mechanical	Psycho-social
Noise	Liquids	Insects	Posture	Stress
Vibration	Dusts	Fungi	Movement	Work pressure
Ionising radiation	Fumes	Bacteria	Repetitive tasks	Monotony
Non-ionising radiation	Fibres	Viruses		Unsociable hours
Heat and cold	Mists			Ergonomical
Electricity	Gases			
Pressure	Vapours			

A risk scoring system (e.g. Figure 2.4.2) should be agreed between the client and contractor's management. This can then help determine the extent of medical health personnel required on site.

		Occupational Health Risks		
Local Medical Support		Low (1)	Medium (2)	High (3)
Good	(1)	2	3	4
Medium	(2)	3	4	5
Poor	(3)	4	5	6

Figure 2.4.2
An example of a health risk scoring system

The total score of the risk assessment can be derived from the above matrix as follows:

Low risk	2–3
Medium risk	4
High-risk	5–6

2.5 Project SHE plan

The health management plan should be incorporated within the project SHE plan. This is to be prepared in advance of any construction activities taking place. For a plan to be effective it must have input from clients, consultants, architects, designers and Planning Supervisors. Once appointed the Principal Contractor must review the plan and ensure it is specific for each phase of construction. Input will be required from each specialist contractor once appointed, after the appropriate tender selection process has been completed. Specific details will depend on the procurement route and project particulars. However, all plans should include the following considerations.

- Existing environment
- Contract strategy
- Health and safety information
- Organisation and responsibility
- Hazard identification and risk assessment (Hazcon 1)
- Implementation of the control measures identified from risk assessments
- Selection and competence of Principal Contractor
- Selection and competence of contractors and suppliers
- Pre-commissioning
- Commissioning
- Informing, instructing and training of the work force
- Pre-job and regular medical examinations where required by construction activities
- Health screening by questionnaire
- Health surveillance
- Links between assessments and known medical conditions
- Record keeping
- Arrangements for medical treatment arising from accidents, incidents or routine causes of ill-health
- Method statements covering tasks involving hazardous materials that cannot be eliminated and for which there are no less hazardous substitutes
- Noise surveys when justified by site activities or conditions resulting from adjacent activities
- Communication mechanisms
- Performance monitoring, e.g. setting targets, audit, management review
- A schedule of meetings that should address health issues. Content should include training, health promotion, and analyses of work injuries and sickness absence, feedback from workers and supervisors with suggestions for improvement
- Handover documents and the SHE file.

2.6 Tender evaluation and contract award

Client health policies should be simple, concise and easy to understand. They need to be communicated to all potential contractors at the tender stage.

The Client and/or the Planning Supervisor must review all of the SHE

documentation that the potential contractors return as part of their tender submissions.

As a minimum, the Client and Principal Contractor should ensure that potential contractors:

- Employ personnel who are medically fit for the work to be done
- Provide a healthy workplace
- Provide information on any substances that will be used during the construction process to employees
- Complete risk assessments to reduce and eliminate any potential health problem.

After the contract award the pre-tender SHE plan must then be developed into the full SHE plan for construction (see §2.5).

2.7 Pre-construction planning

Planning should be a continuous process throughout the life of a project, starting with a broad-brush approach when the initial concept is being considered and developed as the level of detailed information increases. It is essential for success that each stage incorporates and builds on the decisions taken during the previous stages.

The Planning Supervisor and the Principal Contractor should jointly consider the following list of health-related issues for inclusion in the SHE plan:

- Project SHE objectives
- Proposed health management systems
- The joint and several responsibilities of all of the parties
- Identification of and information on significant hazardous operations and materials
- Assessment of risks arising from the identified hazards
- Proposed safe working methods resulting from the risk assessments
- Vendor and contractor pre-qualification and selection procedures
- Auditing arrangements
- Emergency and evacuation procedures
- SHE induction and training
- Welfare and medical provisions
- Workforce consultation
- Health propaganda

- Client requirements
- Management meetings.

2.8 Construction, pre-commissioning and commissioning

The Client, Planning Supervisor and Principal Contractor should have programmes in place to ensure that a safe and healthy working environment exists for construction activities to take place. This will include the full implementation of, and compliance with, the SHE plan.

As part of the SHE plan, the health section needs to reflect such items as:

- The arrangements the Principal Contractor has in place to provide a healthy working environment
- The information provided to address occupational health hazards
- Details of pre-employment medical examination requirements for new employees
- Details of follow up examinations/health surveillance.

The procedures used by the Principal Contractor to review work practices with a view to eliminating or reducing hazardous working conditions need to be described. The need for the assessment of project health risks prior to commencement of site activities must be clarified.

Both the Client and Principal Contractor must have health management structures in place complete with clearly defined line responsibilities.

The Principal Contractor should carry out reviews of work practices to eliminate or reduce hazardous conditions. This must include the identification of hazardous substances and this may include reading the existing SHE file (that will have been produced earlier).

A proactive health culture should be promoted throughout the construction, pre-commissioning and commissioning phases by:

- Management/leadership
- Enforcement of health procedures
- Toolbox talks
- Information handouts
- Promotional campaigns
- Involvement of SHE professionals
- Employee participation in the promotion of a health culture.

Health surveillance

Health surveillance by a health professional will not be appropriate except in the most extreme circumstances. However those individuals likely to be exposed to ultraviolet radiation should be advised of the hazards, the precautions and the symptoms. They should be encouraged to examine themselves for such symptoms and advised of the appropriate action.

3.12 Hyperbaric conditions – decompression illness

As well as decompression illness (DCI), hyperbaric health problems include burst eardrum and ear infections, burst lung, oxygen poisoning and carbon monoxide poisoning.

3.12.1 Risk indicators

Hyperbaric-related health risks are inherent in any work in an increased pressure environment. A worker in increased ambient pressures (or depth) absorbs more gas into the body via the lungs. As this pressure is reduced, the extra gas absorbed is released. During decompression (ascent or reduction in pressure) bubbles may form in the bloodstream but under normal circumstances they are so small as to be insignificant. However, if through error or an accident, an ascent is too rapid, or there is a sudden decrease in pressure, the bubbles increase in size, exerting pressure on surrounding tissue which may become damaged and interfere with the blood supply. Bubbles are regarded in the body as electro-kinetically active and cause most of their effects by blood vessel and blood vessel wall damage.

Examples of high-risk activities or processes

- Air range divers (inland, inshore, offshore)
- Mixed gas divers (predominantly offshore)
- Workers in a compressed air environment of between 0.25 bar and not exceeding 3.5 bar above ambient air pressure, e.g. tunnel workers

3.12.2 Health risk management

Pre-employment assessment

Prior to commencing work and periodically thereafter, workers must undertake a medical examination to verify their overall fitness to work in a compressed air environment. Only a registered physician who has been appointed by the authorities to carry out such examinations and issue certificates of fitness should carry out such examinations.

- Client requirements
- Management meetings.

2.8 Construction, pre-commissioning and commissioning

The Client, Planning Supervisor and Principal Contractor should have programmes in place to ensure that a safe and healthy working environment exists for construction activities to take place. This will include the full implementation of, and compliance with, the SHE plan.

As part of the SHE plan, the health section needs to reflect such items as:

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- Information handouts
- Promotional campaigns
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- Employee participation in the promotion of a health culture.

Figure 2.8.1 describes the mechanism for effective control of a recently discovered health hazard and the professionals involved in that control.

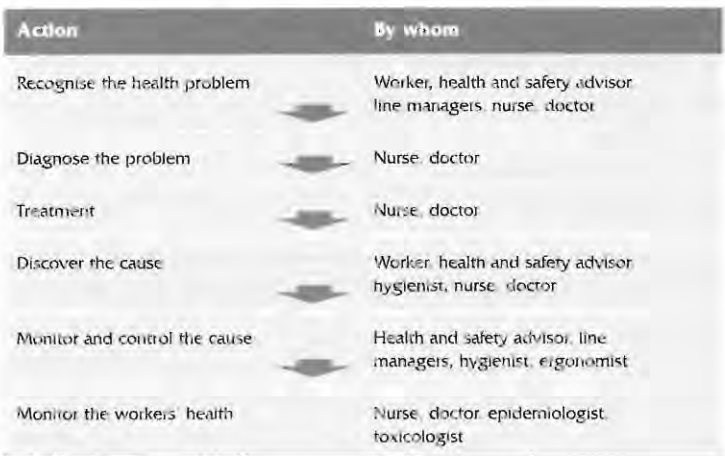

Figure 2.8.1
Action and responsibilities for control of health hazards

2.9 Facilities management

This section highlights activities within the project management of health issues that need to be addressed during the design and construction phase in order to provide the basis for health controls during the operation, maintenance and facilities management of process plants, buildings and offices. It has been accepted that attention to SHE issues in design not only leads to safer construction but also results in more efficient operation, safer maintenance and facilities management. In this section the term facility has been used to describe the building or process/production plant.

The pre-qualification stage for facilities management will require potential contractors to be screened to confirm competence, expertise and experience to undertake the project.

To aid development of a facilities management contractor selection strategy, a checklist for SHE issues (which must include health) needs to be developed and should include such items as:

- Management and leadership
- Organisation and rules
- Training
- Design changes
- Procurement controls

- Emergency procedures
- Inspections and audits
- Incident and accident investigations
- Occupational health
- Personal Protective Equipment (PPE)
- Communications
- Meetings
- Promotional activities
- Off-the-job health.

Screening of tenderers to determine that they have the necessary competence will entail the comparison of health aspects of the bid responses.

Contractors not considered to have policies and procedures on these issues in place are clearly unsuitable to do the work. The list can be used to identify deficiencies in their organisation and administration.

2.10 De-commissioning, dismantling and demolition

It is envisaged that de-commissioning and dismantling are activities prior to demolition or cessation of normal operations for the process plant and, in the case of buildings, the removal of occupancy. The organisation responsible for this work will become the Principal Contractor for that phase.

Key issues during these activities will include such items as the formulation of an agreed SHE plan which includes health issues, a health monitoring system, named responsible personnel for health issues, emergency procedures, minimum training standards and the frequency of inspections and audits, etc.

A typical checklist for de-commissioning, dismantling and demolition should include the following items directly concerned with health:

- Waste control procedures
- Residual hazards
- Noise
- Dust
- Vibration
- Residual waste from previous processes
- Emergency procedures

- Pre employment medicals
- Medical surveillance
- Review work practices to reduce or eliminate hazardous conditions.

2.11 Audit and review

This section examines ways in which companies can verify or audit how they have performed at each stage in the project cycle. At the end of the audit process the company will be left with a snapshot of the project's strengths and weaknesses and where future actions will be required.

2.11.1 Auditing

Auditing is a proactive management technique and should provide a powerful insight into identifying precisely where improvements are necessary and thereby enable preventative actions to be taken as necessary.

Why audit?

- To measure health performance
- To provide an indication of health priorities
- To pinpoint weaknesses
- To identify training needs
- To assess workforce commitment
- To ensure that responsibilities are understood

What to audit?

- Objectives
- Organisation
- Responsibilities, levels of authority, delegated powers
- Plans and policy reviews
- Programmes and practices

Audits provide a more comprehensive and formal assessment of compliance with health procedures and plans. These audits should be carried out at key points during the project life cycle as illustrated previously in Figure 2.1.1.

The frequency and scope of health audits should be clearly set out in the overall SHE plan, which is produced by the Principal Contractor.

2.11.2 Reviews

Project reviews are critical for the successful development of SHE policies, plan, file and procedures. This section deals with a methodology for successfully completing the review at the end of a project.

Review and feedback should be continuous throughout the life cycle of the project. The purpose of the project review is to bring together the project team's experience and learning. This will provide feedback for current and future projects.

The main questions to be answered will be:

- How effective were the health sections of the plan?
- What actually worked and what did not work?
- What should be utilised and what should be changed now and in future projects?

The review method described here, which should be chaired by an independent person, allows project SHE information to be seen in the historical context of the project and provides pointers for future projects.

- Review design risk assessments and compare with construction problems.
- Review the audit database.
- Analyse all medical cases/frequency/incident rates.
- Assess the effectiveness of the health sections of the SHE plan.
- Highlight positive sections of the health sections of the SHE plan.
- Review and analyse the performance of the designers, Planning Supervisor, Principal Contractor, and all contractors in relation to health issues.

To ensure maximum benefit for all participants on future projects the report must be circulated to designers, the client's project team, contractors and subcontractors.

2.12 ECI SHE manual

As explained previously, the ECI SHE manual (ECI 1995) provides guidance for the overall management of SHE. Readers are advised to consult this manual for further information. The relevant sections of the SHE manual are as follows:

- Overview and the parties involved
- Company SHE policy and strategic objectives

- Initial concept and project objectives
- Design
- SHE plan
- SHE costs and benefits
- Contractual arrangements
- Assessment of competence and resources
- Pre-construction and construction planning
- Construction
- Pre-commissioning and commissioning
- Handover
- Operations maintenance and facilities management
- De-commissioning, dismantling and demolition
- Project SHE audit
- Project reviews.

3. Occupational health problems in construction workers

The most common occupational health problems found in construction workers are covered in this chapter. This information is intended to assist managers in the development of company or site policy and procedures. Medical advice should always be sought in suspected cases.

The section for each occupational health problem is divided as follows:

- **Risk indicators** — types of activity or processes which pose a risk to workers.
- **Health risk management**
  Pre-employment assessment — this should be used to benefit employees and not as a means for discrimination.
  Practical advice for managers — a checklist of good practice.
  Signs and symptoms — a list of common symptoms which can be used in education and training of workers. These are not listed in any specific order (either severity or chronology).
  Preventative or protective measures for workers — a checklist of points which can be adopted for toolbox talks or other training. These are written addressing the worker directly.
  Health surveillance — general advice regarding surveillance where appropriate.

3.1 Work-related back pain

This is rarely caused by a single accident or injury, but by a series of repeated, cumulative injuries. Permanent disability can result if preventative action is not taken.

3.1.1 Risk indicators

- Workers exposed to handling loads (lifting, carrying and pushing), repetitive handling work, static and awkward postures (twisting, bending or stretching) or those at the extremes of the range of movements.
- Where the loads to be handled are heavy, bulky, difficult to grasp, unpredictable or difficult to handle, e.g. sharp, slippery.

Examples of high-risk activities or processes

- Pipe fitters and riggers in the movement and handling of loads
- Civil and building operatives in most activities
- Scaffolding operations
- Commissioning and de-commissioning (the opening and shutting of valves and blinds)
- Carpenters and joiners in the erection and stripping of formwork

The very nature of construction operations can give rise to back injury in most activities.

3.1.2 Health risk management

Pre-employment assessment

Can determine to some extent individuals who are at-risk, e.g. those with previous injuries, jobs that involve awkward, heavy loads.

Practical advice for managers

- Identify through risk assessment, tasks/activities that could result in back pain. Involve workers themselves and/or outside experts in these assessments. (Example 3.1.1 is a Manual Handling Assessment Sheet from BG plc).
- Take steps to eliminate or minimise the need for manual handling.
- Refer workers for health surveillance or examination where risk assessment shows this to be necessary.
- Train supervisors and workers to recognise and report the early signs and symptoms of back pain. (Example 3.1.2 is a typical toolbox talk on manual handling of loads at work, courtesy of the HVCA).
- Train supervisors and workers in preventative measures (e.g. good handling technique, good posture and using mechanical aids) relevant to the workplace (Example 3.1.3 is a handling method statement for precast concrete floor beams, courtesy of the Precast Concrete Federation).
- Build in flexibility in job design, encouraging workers to take necessary rest breaks.
- Involve specialists such as engineers and ergonomists in all stages of the design and development of work activities to minimise strain, e.g. the selection of machinery, tools and equipment, job rotation.
- Involve occupational health professionals proactively in educating and training supervisors and workers.

- Set up a workable system for the open reporting of work-related back pain, i.e. via a suitably trained first aider or occupational health nurse.
- Specific duties regarding manual handling exist in common law and in the legislation of most EU Member States.

Signs and symptoms

- Localised pain, discomfort, fatigue and numbness of the muscles, tendons or soft tissues are the most common first symptoms.
- Swelling, tenderness, inflammation and crepitus are found on examination.
- In more severe cases loss of function, limited movement and loss of muscle power can occur.
- Symptoms can be acute, recurrent or chronic. Permanent disability can result if preventative action is not taken.

Preventative or protective measures for workers

- Do not dismiss early symptoms (pain, discomfort) and wait until symptoms become persistent and chronic, resulting in disability before taking any preventative action. Report early symptoms to your supervisor and health and safety representative.
- Adopt good manual handling techniques and always stop and think carefully before lifting any load.
- Always use any manual handling equipment required for the job and follow instructions that have been made to make the task safer.

Health surveillance

There is no specific medical surveillance which can be recommended. However all staff should be aware of the increased potential risks of back injury to:

- those who might reasonably considered to be pregnant
- those persons reporting persistent back pain
- those persons with an existing relevant health problem.

Example 3.1.1
Manual handling assessment sheet

Manual Handling Assessment Sheet

BG plc

Description of handling task:

.....
.....
.....
.....

Weight of Load (Kg) ☐

Frequency Factor

Occasional: 1 Moderate: 3 Frequent: 10

Frequency Factor ☐

Handling Factors

Start or finish of lifting:-	Distance from body Close	Mid	Far	
Floor to knuckle	2	4	7	
Knuckle to shoulder	1	3	5	
Shoulder to above head	2	4	7	☐

Posture and load:	No	Yes	
Is body twisted during handling?	0	2	☐
Does person stoop whilst handling?	0	4	☐
Does carrying distance exceed 10m?	0	3	☐
Is vision restricted by load?	0	2	☐
Is load centrally balanced?	2	0	☐
Is centre of gravity evident?	2	0	☐
Is load difficult to grasp?	0	2	☐
Is load unstable?	0	2	☐
Is load hot or sharp?	0	2	☐
Is pushing or pulling required before or after lifting?	0	2	☐
Will load suddenly jerk free?	0	4	☐
Is load pushed or pulled during lift?	0	2	☐

Addition of Handling Factors ☐

Environmental Factors

	No	Yes	
Is handling space confined?	0	3	
Are conditions wet?	0	1	
Is ground icy?	0	2	
Is ground uneven?	0	1	
Is ground unmade?	0	1	
Does carrying route contain steps?	0	3	
Is handler affected by heat or cold?	0	1	
Is handling activity in third party premises?	0	2	

Addition of Environmental Factors ____

Management Factors

	No	Yes	
Has handling in training task been given			
Is update training regular?	1	0	
Is supervision/ leadership adequate?	1	0	

.....

.....

Addition of Management Factors ____

Addition of Handling, Environmental and Management Factors (H)	
H x Weight (W) x Frequency Factor (F)	
Standard H x W x F	25

Relative Risk Factor:

$$\frac{H \times W \times F}{\text{Standard } H \times W \times F} = \frac{\quad}{25}$$

Relative Risk Factor ____

Notes: This should include: **a.** Duration of handling a risk in a day. **b.** Whether handling a task is an everyday event **c.** Whether particular physical makeup is required.

.....

.....

.....

Example 3.1.2
Toolbox talk on manual handling

MANUAL HANDLING OF LOADS AT WORK

A Manual Handling Operation is any transporting or supporting of a load, including the lifting, lowering, putting down, pushing, pulling, carrying or moving, by hand or by bodily force. Picking up and carrying a toolbox or a step ladder or even picking up a screwdriver or hammer, or a set of stocks, is manual handling, just as unloading and positioning a boiler might be. Anything from the extremely light to something requiring your maximum strength is included.

Manual Handling accounts for a large number of accidents each year and many millions of 'days off' are due to back and other injuries. Once someone's back has been weakened by injury it is often a recurring problem for the rest of that person's life.
All Manual Handling Operations are governed by the Manual Handling Operations Regulations. Employees have a duty to make full and proper use of anything provided by an employer in connection with manual handling. This includes following any advice and training given on lifting, etc.

An employer's duties can be summarised as — Avoid the need for manual handling wherever possible. Assess the risk. Reduce the need by providing mechanical aids. Train staff in good Manual Handling techniques.

Basic Rules for Safe Manual Handling

1. Think before lifting! Is it heavy (above 16 kg)? Is it large or awkward? Where is the centre of gravity? Can you manage it alone?
2. Use the strong muscles and bones of your legs, not the complex and vulnerable ones in your back.
3. Make sure you have a firm grip of the load and that you can sustain the grip for the duration of the lift. Wear industrial gloves to improve grip and protect hands from sharp edges.
4 Make sure you know where you are going to put the load and that the way is clear of obstacles and not slippery. The load must not impede your forward view.
5. If in doubt, get help! There's nothing macho about a slipped disc!

Lifting Technique

1. Tuck chin in. This keeps back as straight as possible and therefore least vulnerable.
2. Feet as close to load as possible, about a hip width apart, one foot slightly in front.
3. Bend the knees and crouch down.
3. Take a full grip, using palms, not fingertips.
5. With elbows tucked in, straighten the legs, lifting smoothly.
6. Carry the load forward at waist height.
7. Change direction by turning on your feet, not by twisting the trunk.
8. Put down in the same careful way and continue being careful as you straighten up.

Questions

Summarise 5 Basic Rules

Source: HVCA

Example 3.1.3
Manual Handling Method Statement for Precast Concrete Flooring

MANUAL HANDLING DURING THE SAFE ERECTION OF PRECAST CONCRETE FLOORING

This guidance by the Precast Flooring Federation is intended to be of assistance to designers and specifiers, those who manage work on site and those who actually handle flooring products on site.

Correct handling of concrete floor beams and infill blocks will minimise the risk of injuries, including those where damage is gradual and progressive. Work should be properly organised, planned and executed, bearing in mind the size and weight of products involved. Wherever appropriate, the use of handling aids and mechanical handling should form part of the planned method of work.

Risk Assessment

Risk assessments of typical contracts including ground and first floor applications have revealed that the main risks are:

(a) Heavy loads and poor posture leading to excessive stress and strain causing injury to muscles and tendons, particularly as the handling involves bending, twisting, stooping or other difficult postures.
(b) Slips, trips and falls, particularly when carrying loads.
(c) Sharp edges, causing cuts and abrasions to the skin.

The risk of injury is largely determined by the weight of individual items, the frequency of handling and the location.

With floor beam and infill concrete block handling the risk of injury is largely determined by the width of individual items — the longer the floor beam, the heavier its weight, and the heavier the concrete block, the higher the risk of injury.

Where, because of site conditions, floor beams cannot be positioned by crane or other mechanical handling equipment, manual handling and carrying risk are greatly increased. In such cases the route between the delivery position of the beams and the erection location should be carefully planned and prepared to minimise the risk created by obstacles or tripping hazards.

The final positioning of floor beams on upper floors typically requires the erector to stand on the same level as that on which the floor beam is resting. In this situation the erector is required to grasp the load at or below foot level and the risk of injury is high.

The final positioning of floor beams on upper floor typically requires the erector to stand on the same level as that on which the floor beam is resting. In this situation the erector is required to grasp the load at or below foot level and the risk of injury is high. When 'blocking-out', cubes of blocks are placed onto pre-positioned floor beams. The blocks are then carried from the cube and laid into the floor beam recess below foot level.

Precautions

Designers and specifiers should where possible minimise the length of floor beams to keep weight as low as reasonably practicable. Typically, 150 mm floor beams weigh 32 kg/m. Infill blocks should be of the lightest type available consistent with the specification required for the properties of the finished floor.

Project planners and contractors should ensure that the items listed below are taken into account when drawing up safe systems of work. Contractors should also give instruction and training and should exercise supervision, to ensure that workers follow these plans and systems of work.

The Task

Handle and erect floor beams and infill blocks in accordance with the following:

- Plan to off load floor beams from the delivery lorry directly onto the walls on which they will be finally positioned using a crane or other suitable mechanical handling equipment.
- Wherever reasonably practicable provide craneage of sufficient capacity to cover the whole of the floor area being laid.
- Where positioning of beams and blocks cannot be achieved using a crane or other mechanical handling device, trolleys or bogies should be used to convey the items. The route should be prepared and be clear of obstacles or tripping hazards.
- Operatives should adjust their work rate to permit short breaks to be taken at regular intervals and should rotate their duties.
- Ensure sufficient time is allowed for the completion of the work allocation without the need for undue haste.
- Cubes of infill blocks should be positioned as close as possible to the laying positions.
- Blocks should never be thrown from one erector to another.

The Working Environment

Prepare roads and routes around the site in advance of the delivery of the blocks and beams and if they are not to be off loaded directly into their laying position, prepare suitable stacking areas. In areas where the beams and blocks are carried or handled, keep the site clear of obstacles and tripping hazards. Uneven, slippery or unstable ground conditions increase the risk of injury.

Training

Erectors should be given information and training on manual handling risk, their prevention and the systems of work to be used on that site to ensure safe manual handling of beams and blocks. Suitable training will also be necessary for designers, specifiers and those managing contracts.

Individual Capability

Particular consideration should be given to employees who are known to have a history of back trouble or other health problems which could affect their manual handling capability.

Health Surveillance

Employers should conduct appropriate health surveillance in order to identify at an early stage any indications that the employee is suffering injury, thereby reducing the likelihood of further harm occurring.

Personal Protective Equipment

When handling beams and block the normal protective equipment needed for use on building sites should be provided by employers and worn by individual workers; in particular safety helmets, safety footwear with protective toe caps and abrasion resistant gloves.

Source: Precast Concrete Federation

3.2 Work-related upper limb disorders

Also known as RSIs (repetitive strain injuries) or musculoskeletal disorders in the neck, shoulders and upper limb. These include the following.

- *Tenosynovitis* — inflammation of the synovial sheaths of certain tendons, e.g. those in the forearm.
- *Tendinitis* — inflammation of the muscle tendons and the surrounding tissue, where there are no synovial sheaths.
- *Bursitis* — A bursa is a lubricated bag of synovial fluid and is found where the skin or muscles and tendons rub against bone. Bursae may become inflamed and filled with fluid as a result of excessive loading and cause conditions such as 'housemaid's knee' (swelling on the front of the kneecap), or hodman's shoulder (swelling on the shoulder from carrying hods of bricks).
- *Carpel tunnel syndrome* — an increase in fluid pressure within the carpel tunnel of the wrist resulting in compression of the median nerve.
- *Tennis elbow* — tenderness and swelling in the extensor tendons attached to the bony prominence of the elbow, sometimes spreading down the forearm.
- *Trigger finger* — tenosynovitis of the muscles that flex the fingers.

Permanent disability can result if preventative action is not taken.

3.2.1 Risk indicators

- Workers exposed to repetitive tasks involving the fingers, hands or whole arm, e.g. tight gripping, hammering, pushing or pulling, twisting.
- Working in awkward postures can exacerbate this.
- Tasks involving work for long periods of time with little or no variation without breaks or changes in activity.

Examples of high-risk activities or processes

- Computer operatives
- Operatives using pneumatic drills or other vibrating or percussive tools
- Scarifiers
- Compactors
- Dumper drivers

3.2.2 Health risk management

Pre-employment assessment

To some extent this can determine individuals that are at-risk, e.g. those with previous injuries, arthritis or other work-related pains.

Practical advice for managers

- Identify through risk assessment, tasks/activities which could result in work-related upper limb disorders. Involve workers themselves and/or outside experts in these assessments.
- Take steps to eliminate or at least minimise the risks.
- Refer workers for health examination where risk assessment shows this to be necessary.
- Train supervisors and workers to recognise and report the early signs and warning symptoms of work-related upper limb disorders. Example 3.2.1 shows an early warning notice to give to employees, courtesy of GEC Alstom. Supervisors should be alert for signs of problems, for example improvisations such as bandages on wrists.
- Train supervisors and workers in preventative measures (e.g. positioning materials, equipment, etc. in a more convenient position, good working techniques and working posture, short pauses in work) relevant to the workplace.
- Build in flexibility in job design, encouraging workers to take rest breaks as needed.
- Involve specialists such as engineers and ergonomists in all stages of the design and development of work activities and work stations to minimise strain, e.g. the selection of machinery, tools and equipment, job rotation.
- Involve occupational health professionals proactively in the education and training of supervisors and workers.
- Set up a workable system for the open reporting of work-related upper limb disorders, i.e. via a suitably trained first aider or occupational health nurse.
- Specific duties exist in common law and in the legislation of most EU states.

Signs and symptoms

- Localised pain, discomfort, fatigue and numbness of the muscles, tendons or soft tissues are the most common first symptoms.
- Swelling, tenderness and inflammation are found on examination.

Example 3.2.1
Warning notice for upper limb disorders

WARNING NOTICE TO GIVE TO EMPLOYEES
UPPER LIMB DISORDERS

Upper limb disorder (ULD) is the term used to describe a range of conditions affecting the upper limbs. Some of the conditions used to be called Repetitive Strain Injury (RSI) or tenosynovitis (Teno).

Although many symptoms are associated with ULD, the most common are pain, restriction of joint movement, and soft tissue swelling. In the early stages there may be little or no visible sign of bruising or swollen joints. Sometimes symptoms start gradually and may result in changes in work pattern without the sufferer being completely aware of it.

In the initial stages of the condition, the symptoms are mild and the condition is reversible. If the condition is not treated the symptoms will become more severe and eventually may even prevent simple daily tasks from being performed.

The most common causes of ULD result from repetitive movements especially if force and an awkward posture of the hand, wrist, arm or shoulder are involved.

It is important to remember that the likelihood of ULD developing varies from one individual to another and a person's sensitivity cannot be predicted.

Jobs at this site which have been identified as involving activities where there is a risk of ULD developing in sensitive individuals include

(to be filled in for each project)

To safeguard your health the company has reduced the risk to as low a level as is reasonably practicable by

(to be filled in for each project)

If you experience aches or pains in the upper limbs, which you believe, are related to your work you must report them immediately to

(to be filled in for each project)

Remember, if ignored, the problem could get worse and possibly become permanent. Early treatment is therefore important.

Source: Alstom Automotive

- In more severe cases loss of function, limited movement and loss of muscle power can occur.
- Symptoms can be acute, recurrent or chronic and may cause permanent damage.

Preventative or protective measures for workers

- Do not dismiss early symptoms (pain, discomfort) and wait until symptoms become persistent and chronic, resulting in disability before taking any preventative action. Report early symptoms to your supervisor and health and safety representative.
- Ensure that the tools and equipment that you use are comfortable and don't require excessive force to operate.
- Ensure good working techniques and posture, job rotation and breaks.

Health surveillance

Because the term describes a range of conditions and the susceptibility will vary from one individual to another, there is no single specific medical surveillance that can be recommended. However managers should consider seriously any complaints of signs or symptoms, particularly from individuals who may be involved in 'high-risk activities or processes' such as those mentioned earlier, and seek professional medical assistance.

3.3 Noise-induced hearing loss

Noise at high levels can lead to permanent hearing damage. The level of noise and the period of exposure are the key risk factors.

3.3.1 Risk indicators

- Workers with prolonged exposure (intermittent or continuous) to noise are at-risk from permanent hearing damage.
- Member states have their own legislation which should be consulted. Often, different action levels are identified, for example in the UK:
  - first action level (daily personal noise exposure of 85 dB(A))
  - second action level (daily personal exposure of 90 dB(A))
  - peak action level (sound pressure of 200 Pa (140 dB))

  These figures are based on a time-weighted average of an 8 hour day.

Examples of high-risk activities or processes

- Steel erectors (bolt tightening)
- Millwrights (rotating machinery)
- Welding
- Pipe fitters

- Pneumatic drillers
- Woodworking machinists
- Plant operators
- Pneumatic/gas equipment de-pressurisation

3.3.2 Health risk management

Pre-employment assessment

Audiometry should be performed as part of a pre-employment medical, in particular on workers who are likely to be at-risk. It can provide a baseline for further surveillance.

Practical advice for managers

- A competent person should carry out risk assessment where workers are exposed above the first action level. Basically, noise levels should be reduced to as low as is reasonably practicable. If daily noise exposure is still above the first action level (85 dB(A)), ear protection must be provided and the areas marked where they should be worn.
- Take steps to eliminate or at least minimise the risks.
- Refer workers for health examination where risk assessment shows this to be necessary.
- A noise reduction programme/policy should be developed, reducing exposures to as low as reasonably practicable and prioritising methods of noise control. This will include designing out the risk.
- Ensure areas or operations where the risk cannot be eliminated are clearly identified with warning signs etc.
- Ensure suitable ear protection is worn by exposed workers.
- Ensure information and training are available for workers and supervisors regarding the risk of exposure, the damage caused, minimising risks, personal responsibilities and obtaining ear protection. Example 3.3.1 is a typical toolbox talk courtesy of the HVCA.
- A noise problem identification questionnaire is given in Chapter 4 (Example 4.7.2).

Signs and symptoms

- Noise-induced hearing loss is primarily centred on the ear's ability to hear sound at the upper level of speech appreciation (4 kHz), i.e. explosive consonants such as b, k, t, etc.
- Over time the hearing loss extends over the range of 3 – 6 kHz considerably reducing the individual's ability to distinguish speech.

- Other symptoms include tinnitus (constant ringing in the ears), stress and disturbed sleep.
- Unlike hearing loss due to ageing, noise-induced hearing loss is not improved by the use of a hearing aid, making it particularly distressing for sufferers. Hearing aids will amplify all sounds but cannot improve the distortions of hearing.
- Once hearing has been damaged, there is no effective treatment.

Preventative or protective measures for workers

- Use noise control equipment provided (i.e. to lower ambient noise).
- It is essential that ear protectors are provided where there is a risk of hearing loss and that they are worn at all times. At high noise levels, removing protectors for even a short period can lead to the maximum 'daily personal noise exposure' being exceeded.
- Use correctly fitted ear protectors (plugs, muffs or other devices) following any instructions, keep them clean, inspect them regularly and replace if damaged.
- Inform supervisors or health and safety officers without delay if equipment is not in efficient working order.

Health surveillance

Audiometry is a simple procedure, but must be carried out by a competent person. It can aid health management in the following ways:

- It provides a baseline for each worker prior to commencing a job or certain tasks.
- It can provide information on the effectiveness of hearing management programmes.
- It can help identify workers who are particularly susceptible to noise.
- It can effectively demonstrate to individual workers the effects of failure to wear hearing protection, thus providing an opportunity to reinforce workers' own responsibilities with regard to preventing hearing loss.
- Regular monitoring will provide an auditory record for each individual.
- A sample audiometric questionnaire is given in Chapter 4 (Example 4.7.1)

Example 3.3.1
Toolbox talk on noise at work

NOISE AT WORK

Building site plant and operations are often very noisy. Exposure to excessive noise can, over a period of time, lead to permanent hearing loss. In addition, noise is very wearing on the nerves and can cause irritability and loss of concentration leading to mistakes and accidents.

The delicate mechanism in our ears wears out gradually as we get older. Loud noise wears it out more quickly, leading to premature deafness. There is no cure. Prevention is required by UK legislation.

What to do about noise

1. Stand 2 metres away from your mate and try talking. If you cannot hear each other without shouting, action is required.
2. *Action Level One.* Noise measurements with a special instrument must be taken. This reads in decibels dB(A). 85 dB(A) is the maximum you are allowed to hear all day.
3. The owner of the noisy plant must take steps to reduce the reading to below 85 dB(A). This could be achieved by changing to a quieter machine, moving it further away, having it properly serviced, placing it inside an acoustic enclosure, etc.
4. If, after doing all that is reasonably practicable, the noise is still above 85 dB(A) you can ask for hearing protection (earplugs, muffs, etc.) so that the noise you actually hear is below 85 dB(A).
5. *Action Level Two.* If the noise is still above 90 dB(A) the hearing protection must be provided and you must wear it.
6. Hearing protection must be suitable and a good fit. Ear defenders (UK BS 6444) will usually be adequate.
7. Ear Plugs (Bilsom Dams) should be used once only and then discarded. Cotton wool is totally ineffective as a noise protector.
8. Wash hands before touching and inserting ear plugs and do not use if you have an ear infection — tell your supervisor. KEEP EAR DEFENDERS CLEAN.
9. Owners of noisy plant may declare immediate surroundings to be an EAR PROTECTION ZONE and erect warning signs. Ear protection must be worn continually in this zone. If you need to communicate with your mate more than by hand signals, step outside the zone first.
10. Remember your duty to 'comply and cooperate' and also take care of PPE.

Questions

Summarise Main Points

Source: HVCA

3.4 Hand – arm vibration syndrome (e.g. vibration white finger)

Hand – arm vibration syndrome causes damage to the hands and arms from prolonged use of high-vibration tools. In the early stages, improvement may occur by stopping tasks associated with vibration. In the later stages the condition is more likely to become permanent.

3.4.1 Risk indicators

- Workers who regularly use high-vibration hand-held tools for prolonged periods.
- Vibrating tools with frequency of 2 – 1500 Hz are potentially damaging but the range of 5 – 20 Hz is the most damaging. Workers' 'vibration dose' can be calculated from duration of exposure and vibration magnitude.

Examples of high-risk activities or processes

Work tools and processes where the possibility of risk should be investigated are:

- Manual grinding work
- Riveting tools
- Chainsaws and similar woodworking machines
- Power hammers such as caulking and chipping hammers, concrete breakers
- Percussive drills.

3.4.2 Health risk management

Pre-employment assessment

Pre-employment assessment (by questionnaire and medical examination) will establish a baseline from which to judge the results of routine assessment. It will also help identify at-risk workers, e.g. sufferers of Raynaud's disease and smokers. Education of workers regarding the early signs of hand – arm vibration, and preventative measures under their control, which can help reduce the risks, can also be covered at this stage.

Practical advice for managers

- Carry out risk assessment as necessary. Measurement of hand – arm vibration is not a simple task and should only be carried out by a competent person.

- Take steps to eliminate or at least minimise the risks.
- In the UK, the British Standard BS 6842: 1987 describes a procedure for making these measurements normalised to an 8 hour working period A(8). Workers regularly exposed to an A(8) of 2.8 m/s^2 are particularly at-risk, but it should be noted that exposure below this action level would not eliminate risk.
- Train supervisors and workers to recognise and report the early signs and symptoms of hand – arm vibration disorders.
- Train supervisors and workers in preventative measures such as using gloves, heating pads, tools with heated handles, warm weather-proof clothing and organising worker rotation.
- Set up a workable system for the open reporting of hand – arm vibration symptoms, i.e. via a suitably trained first aider or occupational health nurse.
- Encourage the reporting of old or faulty equipment in order to minimise excessive vibration. Regular maintenance or planned replacement would be a better option.
- Involve specialists such as engineers and ergonomists in all stages of the design and development of work activities to minimise vibration directed to the hand. High-vibration tools should be avoided where possible.
- Refer workers for health surveillance where risk assessment shows this to be necessary.
- Involve occupational health professionals in educating and training supervisors and workers.

Signs and symptoms

- Tingling or pins and needles in the fingers often occur at the end of the day with accompanying numbness.
- Whiteness appears at the tips of the fingers when exposed to the cold.
- The fingers become pale with reduced sensation in the cold. This is followed by a rapid red flush in the hand as blood returns to the fingers and painful throbbing.
- As the condition worsens, attacks occur more frequently and for longer in the cold weather causing pain and reduced dexterity in the hands.
- Eventually attacks may even occur in warm environments.
- In very severe cases, blood supply is permanently impaired causing a blue – black appearance of the hand.

Preventative or protective measures for workers

- You should maintain a good blood flow to the fingers by keeping the hands and body warm reducing the risk of injury:
  - Wear gloves both for protection and warmth.
  - Use heating pads.
  - Use tools with heated handles.
  - Wear warm weatherproof clothing.
  - Do warm-up exercises prior to starting work.
  - Use a warm sheltered area for breaks.
  - Massage and exercise the hands and fingers during breaks.
- Inform supervisors/health and safety officers if equipment is faulty, to minimise the risk of excessive vibration.
- Avoid using vibrating tools and equipment for long periods of time without a break.
- Smoking affects blood circulation and therefore give up if you can.

Health surveillance

Health surveillance is recommended on an annual basis for those individuals involved in high-risk activities or processes. For those newly employed in such activities or processes more frequent surveillance is recommended, e.g. six monthly.

The surveillance should include a clinical examination and possibly a short screening questionnaire. The examination may be carried out by a suitably trained occupational health nurse under the direction of a medical practitioner. All workers should be encouraged to report any relevant symptoms at an early stage.

3.5 Work-related dermatitis

Work-related dermatitis is caused by exposure to various substances, activities or environments. With care at the early stages, most cases can be prevented. As dermatitis becomes more chronic it can become increasingly difficult to clear. Nevertheless, accurate diagnosis, leading to timely corrective action, can almost always achieve improvement. This may be sufficient to allow the worker to continue their job.

3.5.1 Risk indicators

- Workers whose skin is exposed to windy, wet and cold weather. This has the effect of removing the thin layer of lipids on the skin's

surface, leaving the skin more susceptible to the penetration of irritants, e.g. cement, mortar and plaster.
- Work involving skin exposure to dusts, chemicals, site contaminants and ultraviolet (UV) radiation. Development depends upon a number of factors, e.g. the strength of the substance, length of skin contact and skin sensitivity.

Examples of high-risk activities or processes

- Machinists
- Concrete workers
- Brick layers
- Civil operatives working in trenches
- Plant operatives
- Carpenters and joiners
- Millwrights (rotating machinery)
- Painters
- Plasterers
- Insulators
- Commissioning and de-commissioning operatives
- Cleaners/waste collectors
- Supervisors

3.5.2 Health risk management

Pre-employment assessment

Education of at-risk workers regarding the early signs of work-related dermatitis and preventative measures under their control, which can help reduce the risks, can be covered as part of the pre-employment assessment. Individuals at particular risk, e.g. eczema sufferers, can also be identified and encouraged to take particular care.

Practical advice for managers

- Complete risk assessments for at-risk work areas or operatives.
- Take steps to eliminate or at least minimise the risks by avoiding the use of harmful substances or work operations in exposed conditions wherever possible.
- Inform supervisors and workers about any substances they work with that can cause dermatitis.
- Train supervisors and workers in control measures. A framework for a briefing session on work-related dermatitis is given in Example 3.5.1, courtesy of Amec Process and Energy.

- Train supervisors and workers to recognise and report the early signs and symptoms of work-related dermatitis.
- Refer to occupational health professionals, for the accurate diagnosis of occupational dermatitis. They can also be proactive in educating and training supervisors and workers.
- Ensure adequate washing facilities for workers and cleaning procedures for protective clothing (unless disposable).
- Set up a workable system for the open reporting of work-related dermatitis, i.e. via a suitably trained first aider or occupational health nurse.

Signs and symptoms

- The skin will appear dry, red, sore and sometimes itchy, reducing the skin's ability to withstand the effects of chemicals, dusts, etc.
- The cells in the outer layer of the skin will shrink and become brittle and crack.
- The cracks will eventually penetrate the skin barrier and bleed, providing dust, chemicals and bacteria access to the sensitive underlying tissue. At this stage the skin can be extremely inflamed and painful.
- Dermatitis can spread all over the body.
- Some substances can cause serious damage if they reach the internal organs.

Preventative or protective measures for workers

- Protect the skin, avoiding contact with the irritant by wearing gloves and other protective clothing. During work, cover cuts and abrasions with waterproof dressings.
- Where possible use tools or equipment to handle the substance.
- Aim to keep the workplace and equipment free from contamination.
- Keep gloves and other protective clothing free from contamination.
- Wash contaminated skin immediately. Use purpose-designed skin cleansers to remove oil and grease. White spirit and turpentine will dry the skin and may even penetrate into the body.
- Protect skin from the sun. A sunburnt skin has less ability to resist penetration by chemicals.
- Top up the 'surface lipid film' with a barrier cream especially during the winter months when the sebaceous glands are less productive.
- Report early symptoms to your supervisor or health and safety officer.

Health surveillance

The level and type of health surveillance for dermatitis will vary according to the types of substances, activities or environments suspected of giving rise to the condition and the levels of exposure experienced by individuals. Attention is drawn to the fact that where

Example 3.5.1
Framework for briefing on work-related dermatitis

WORK-RELATED DERMATITIS

The Problem

An estimated 84 000 people have dermatitis caused or made worse by work, resulting in 132 000 lost working days each year. This costs employers up to £20 m a year.

What's the problem?

Occupational dermatitis affects virtually all industry and business sectors.

Symptoms of the condition can be redness, itching, scaling and blistering of the skin. If it gets worse, the skin can crack and bleed and the dermatitis can spread all over the body. It can be extremely painful — bad enough to keep people off work and serious enough to force them to change jobs. But, with a little care, most cases can be prevented. But some people can be affected for life.

How is it caused?

Occupational dermatitis is caused by the skin coming into contact with certain substances at work. It is not infectious so it cannot be passed from one person to another.

How quickly you get it depends on a number of things:

- The substance
- Its strength or potency
- How long and how often it touches the skin.

Dermatitis usually affects the hands or forearms, the places most likely to touch the substance. Other places are:

- Face
- Neck
- Chest

So what's it to me?

If you are the working, it can affect you for life:

- Your health
- Your livelihood
- Your family
- Your social life
- Your appearance

Although dermatitis isn't catching, some people think it is.

Why employers should take action

Legislation requires employers to assess the risk of dermatitis and to take action to prevent it. Also, dermatitis costs money — from sickness absence, loss of production, staff turnover, retraining, etc.

High-risk industries and processes

Occupational dermatitis occurs in virtually all industries and business sectors. But the industries where it is most widespread are:

- Hairdressing/beauty care
- Cleaning
- Engineering
- Rubber
- Agriculture/horticulture
- Catering
- Construction
- Printing
- Offshore
- Health services

What can you do to prevent dermatitis at work?

Ask yourself four questions:

- Do we have a problem?
- Do we know what we are using?
- Can we use a safer alternative?
- Can we do the job in a safer way?

In some jobs there is nothing you can do to stop contact with substances that can cause dermatitis but there is still a lot you can do to protect yourself.

What you can do to prevent dermatitis at work

- Follow the steps in HSE's Health Risk Management Guide
- Refer to key HSE publications for more guidance.

Regulations (UK)

The Control of Substances Hazardous to Health Regulations 1994.

Guidance

Guidance for employers and employees — new occupational dermatitis leaflet.

Case Study

A company manufacturing vehicle engines started to receive complaints about skin irritation from machine operators involved in grinding operations. This was thought to be due to the effects of the metalworking fluids used. The factory manager consulted a different metal working fluid supplier who gave advice on the overall management of metalworking fluids, including the correct mixing of water-based fluids and how to test the condition of the fluid. The company also installed an automatic fluid mixer and started to use a new high quality metalworking fluid. As a result, the problem of skin irritation disappeared. The changes resulted in considerable financial benefits to the company; effective management of the fluid meant that much less of it was used, the machine down time was reduced because fewer fluid changes were needed and there was less waste to dispose of.

Source: Amec Process and Energy

substances are used which are known to cause severe dermatitis, Member State legislation may impose a requirement for health surveillance. It is recommended that, where cases of dermatitis have occurred, or as a result of an assessment are expected to occur, advice is sought from a medical practitioner (preferably one with occupational health experience).

Surveillance may be carried out at frequencies varying from weekly to annually in accordance with the risks represented by the substance, process and levels and duration of exposure. A medical practitioner with occupational health experience will advise on the appropriate level of surveillance. The examinations may be conducted by a medical practitioner, an occupational nurse or first aider trained to recognise the symptoms.

3.6 Respiratory sensitisers

Respiratory sensitisers, when inhaled, can cause allergic reactions in the respiratory system which may be irreversible (e.g. asthma).

3.6.1 Risk indicators

Workers exposed to breathing respiratory sensitisers (e.g. isocyanates woods, solder flux, mineral fibre, some glues and resins).

Examples of high-risk activities or processes

- Welders
- Welders' mates
- Woodworkers
- Carpenters and joiners
- Grit blasting
- Insulators
- Painters
- Supervisors
- De-commissioning operatives
- Demolition/concrete cutting

3.6.2 Health risk management

Pre-employment assessment

Education of at-risk workers regarding the early signs of work-related asthma and preventative measures under their control, which can help reduce the risks, can be covered as part of the pre-employment

assessment. Individuals at particular risk, e.g. those with other allergies, can also be identified and encouraged to take particular care.

Where there is a high degree of hazard, surveillance should include a more detailed pre-employment assessment including a detailed history and lung function test.

Practical advice for managers

- Complete risk assessments for at-risk work areas.
- Take steps to eliminate or at least minimise the risks by 'designing out' the use of respiratory sensitisers wherever possible.
- Ensure efficient and rigorous control methods for removing dusts in the workplace.
- Inform supervisors and workers about any substances they work with that can potentially irritate the lungs.
- Train supervisors and workers in control measures.
- Train supervisors and workers to recognise and report the early signs and symptoms of occupation-related asthma (sensitisation). Risk assessments should then be reviewed, as well as dust removal systems.
- Set up a workable system for the open reporting of work-related asthma, i.e. via a suitably trained first aider or occupational health nurse.
- Refer at-risk workers to occupational health professionals, for health surveillance and accurate diagnosis of occupational asthma. They can also be proactive in educating and training supervisors and workers.
- Ensure adequate washing facilities for workers and cleaning procedures for protective clothing (unless disposable) are readily available.

Signs and symptoms

- A respiratory sensitiser triggers an irreversible allergic reaction to the substance in the respiratory system. Once a person is sensitised an immediate (within minutes) or delayed (4 – 24 hours) response can result. Sensitisation can take months or years of breathing in the sensitiser.
- Attacks of coughing, wheezing, shortness of breath and chest tightness occur with sensitisation.
- Also a runny or stuffy nose, sneezing and watery or prickly eyes.
- Continued exposure can result in more severe symptoms and permanent nose, throat and lung damage.

- Asthma attacks occur more frequently and can be triggered by other substances, e.g. smoking, pollution and animal fur.
- A minority of people who develop occupational asthma will be forced to discontinue work as their health deteriorates.

Preventative or protective measures for workers

- Do what you can to ensure dust and other possible sensitisers are efficiently and rigorously removed from the work area. Report promptly any problems to your supervisor.
- Use personal respiratory protection, which should be provided.
- Keep respiratory masks and other PPE free from contamination.
- Sensitisation to a substance should be reported to your manager or health and safety representative. Medical advice should then be sought.
- Smoking can exacerbate symptoms of the condition and therefore should be discouraged.

Health surveillance

Unless risk assessment shows the health risks to be minimal, a system of health surveillance should be set up for employees exposed to respiratory sensitisers. The condition can then be diagnosed early and control measures taken. Attention is drawn to the fact that, for exposure to substances known to cause industrial asthma, Member State legislation may impose a requirement for health surveillance.

Health surveillance may be considered under one of three levels as follows.

- Where the hazard is limited and exposure low, health surveillance should involve obtaining pre-employment present/past asthma history information and educating individuals regarding the symptoms and the need for early reporting. An example of a respiratory problem's surveillance questionnaire is given in Chapter 4 (Example 4.7.4).
- Where there is more positive evidence of a hazard (e.g. documented evidence that the substance is known to cause respiratory sensitisation), health surveillance should include an enquiry and reporting system (possibly an annual screening questionnaire) and a pre-placement lung function test. Any suspected cases should be referred to a medical practitioner or nurse.
- A questionnaire identifying relevant symptoms should be administered 6 and 12 weeks after commencement of employment

and at yearly intervals thereafter. A sample questionnaire is given in Example 4.7.4. Lung functions should be measured at these times. Individuals returning to work after absence due to respiratory illness should be questioned about relevant symptoms.

For example, in the UK an up-to-date list of respiratory sensitisers is published by the HSE annually in EH40 Occupational Exposure Limits, and this is based on EU limits. Also SWORD (Surveillance of Work-related Occupational Respiratory Disease) sponsored by the UK's HSE, collects data on new cases of occupational asthma. It is a voluntary scheme run by the Epidemiological Research Unit based at the National Heart and Lung Institute, London.

3.7 Asbestos-related diseases

Asbestos-related diseases are covered under the term pneumoconiosis, which literally means 'dusty lungs'. It usually refers to conditions that can cause permanent damage to the lungs (e.g. cancers of the chest and lungs, asbestosis). One asbestos fibre can result in the development of such diseases.

3.7.1 Risk indicators

- In construction, workers exposed to breathing asbestos are at-risk.
- The more asbestos dust inhaled the greater the risk to health.
- There is good evidence that lifestyle and smoking increase the carcinogenic potential of asbestos fibre.

Examples of high-risk activities or processes

The presence of intact asbestos materials on site does not necessarily constitute a risk. However any work that disturbs this material (including asbestos cement) such as breaking, drilling or cutting releases fibres into the air. The following list shows where asbestos is most likely to be found in buildings and is in approximate order of fibre release (most to the least).

- Sprayed or loose packing as firebreaks in ceiling voids.
- Moulded or pre-formed sprayed coatings and lagging — generally for thermal insulation of pipes and boilers.
- Sprayed asbestos mixed with hydrated asbestos cement — generally as fire protection in ducts, firebreaks, panels, partitions, soffit boards, ceiling panels and around structural work.
- Insulating boards used for fire protection, thermal insulation, partitioning and ducts.

- Some ceiling tiles.
- Vinyl flooring backed with asbestos paper.
- Paper and paper products used for insulation of electrical equipment; asbestos paper has been used as fireproof facing on wood fibreboard.
- Asbestos cement products — usually flat or corrugated sheets. The latter are largely used as roofing and wall cladding. Other products include gutters, rainwater pipes and water tanks.
- Certain textured coatings.
- Bituminised products such as flashing, floor tiles.

3.7.2 Health risk management

Pre-employment assessment

The hazards of asbestos dust should be reinforced as part of the medical for construction workers potentially at-risk.

Where there is a high degree of risk, surveillance should include a more detailed pre-employment assessment as a 'baseline', which would include a detailed history and lung function test.

Practical advice for managers

- Asbestos-containing materials, providing they are in good condition and not subject to damage or disturbance should be carefully managed and a full risk-assessment carried out to agree appropriate action.
- Licensed specialist contractors must be used for both removal and disposal of asbestos-related products.
- Carry out risk assessment and identify, assess and manage the risk of asbestos exposure to workers. It may be necessary to use specialist expertise.
- Take steps to eliminate or at least minimise the risks.
- Ensure efficient and rigorous control methods for removing asbestos dust in the workplace.
- Inform supervisors and workers of the presence of asbestos, its location and type and the health risks if it is disturbed.
- If supervisors and workers must work with asbestos, ensure that they are aware, fully trained in working with asbestos and are implementing control measures, e.g. PPE (especially correctly fitted masks/respirators), minimising asbestos dust, keeping the material wet, disposal in sealed labelled containers whilst still damp.
- Ensure correct selection, choice and maintenance of respiratory protective equipment.

- Set up a workable system for the open reporting of any material suspected of containing asbestos.
- Occupational health professionals can also be proactive in educating and training supervisors and workers.
- Ensure adequate cleaning facilities and procedures for protective clothing (unless disposable). Protective clothing should never be taken home to wash. Disposable clothing, respiratory masks and filters should be disposed of as asbestos waste.
- Be aware of the likelihood of hidden asbestos in existing buildings. Appropriate surveys should be carried out.

Signs and symptoms

- There is often a long delay between first exposure to asbestos and onset of the diseases (15–60 years).
- There are no early symptoms of note such that workers can be exposed without realising it.
- Cancers of the chest and lungs (e.g. mesothelioma) and chronic fibrotic lung disease (e.g. asbestosis) can occur.
- There is no cure for asbestos-related diseases.

Preventative or protective measures for workers

Remember! ONE asbestos fibre can result in the development of these diseases for which there is, as yet, no cure!

- Stop work and report any material or dust that you suspect contains asbestos.
- If you are working with asbestos, ensure that you have been thoroughly instructed about the precautions that need to be taken to protect health and follow them. If you are uncertain about any aspect of this, stop work and seek immediate advice.
- Keep asbestos dust to as low a level as possible, e.g. by keeping the material damp, using hand tools and disposal of asbestos whilst still damp and as you go along.
- Ensure that control measures (e.g. ventilation) are working correctly. Report any problems to your supervisor.
- Use personal respiratory protection and clothing, which must be provided.
- Never remove respiratory protection and clothing in a contaminated area.
- Ensure respiratory masks and clothing are in good condition and free from contamination.
- Never take protective clothing home to wash. Masks and filters

should be disposed of as asbestos waste.
- Wash hands and face before handling food, drinking, smoking and leaving work site.

Health surveillance

National legislation may impose a requirement for health surveillance of workers exposed to asbestos. For example in the United Kingdom the relevant legislation is Regulation 16 of the Asbestos at Work Regulations 1987. Under these regulations surveillance must be conducted under the direction of an 'employment medical adviser' or an 'appointed doctor'. Specific 'action levels' stipulate what must be done and under what conditions. National legislation must be studied to ensure compliance.

The surveillance shall include:

- A medical examination not more than two years before the beginning of the exposure.
- Periodic medical examinations at intervals of not more than two years or shorter if determined by the medical practitioner.

The medical examination must include a specific examination of the chest. National guidance is available in most states, advising medical practitioners on what to include in the examinations.

3.8 Silica-related diseases

Silica-related diseases (e.g. silicosis) are also covered under the term pneumoconiosis.

Silica occurs as a natural component of many materials used or encountered within the construction industry. Free silica is always present in substantial quantities in sand, sandstone and granite. It often forms a proportion of clay, shale and slate. Although unusual, it can also be contained in chalk, limestone and other rock.

3.8.1 Risk indicators

As silica is present in many construction materials, all personnel are likely to be at-risk of silica-related diseases at some time in their career.

Examples of high-risk activities

In particular, the following activities can expose workers to products that contain free silica:

- Quarrying
- Tunnelling
- Demolition
- Grit/sand blasting
- Scabbling of concrete.

3.8.2 Health risk management

It is essential that managers refer to national legislation and seek specialist advice from government agencies. This section only gives a brief overview.

Pre-employment assessment

It is important to have a pre-employment medical conducted for all operatives likely to be at-risk. This should include such items as chest X-rays, lung function tests. The medical should be done under the supervision of a doctor.

Practical advice for managers

- Conduct risk assessments.
- Take steps to eliminate or at least minimise the risks.
- Prevent exposure. Where this is not possible the correct PPE must be provided.
- Reduce exposure to the silica e.g. by use of water sprays, exhaust ventilation of the area and tools, use of enclosed plant with filtered air supplies etc.
- Maintain dust control measures.
- Ensure regular monitoring is being conducted.
- Arrange regular health checks.

Signs and symptoms

- Cases of short-term exposure to high concentrations are rare, but when they do occur they do lead to an early death.
- More common is progressive silicosis; this is due to exposure over a longer period. This causes fibrosis of the lung tissues with a consequent loss of lung tissue.
- Persons affected by silicosis usually suffer shortness of breath and find it difficult to walk short distances up and down stairs. The effect is irreversible. Victims eventually become either house or bed bound and eventually die prematurely from a congestive heart failure.

Preventative or proactive measures for workers

- If you are working on any activity that could expose you to crystalline silica you must ensure that your employer has advised you of the potential risk and the correct working procedures to minimise the risks.
- Avoid creating dust.
- Use extraction equipment and other control measures provided.
- Make sure that for any respiratory equipment that you are wearing, you have been trained in its use, it fits properly, it is clean; if a filter is provided make sure it is changed regularly and make sure it is stored properly.
- Always wash your hands and face before eating, smoking or going home.
- Do not take dirty PPE or clothes home.

Health surveillance

Where work carries significant exposure to respirable crystalline silica and lasts a long time then health surveillance should be carried out and should include lung function testing and chest X-rays.

Silicosis may also be a 'Prescribed Disease' within many countries, as it is in the UK. Therefore national legislation should be consulted.

3.9 Radiation diseases (ionizing radiation)

Radiation is energy transmitted, emitted or absorbed in the form of particles or waves either of ionising or non-ionising, the latter not normally causing tissue damage. The level of dose and/or the period of exposure are the key risk factors. There are few early signs and symptoms but high dose exposure can be fatal.

3.9.1 Risk indicators

Workers exposed to external radiation sources and from the intake of excessive radioactive materials into the body by radiation whether accidentally or intentionally, as in Radiation Therapy.

Examples of high-risk activities or processes

- Radiographers and their supervisors
- All construction personnel who ignore barriers preventing access to high-risk areas

3.9.2 Health risk management

Pre-employment assessment

It is important to have a pre-employment medical conducted for all operatives likely to be at-risk. In addition, only appropriately trained specialist contractors should be used for all work where exposure to radiation is possible.

- The specialist contractor should be the subject of careful pre-qualification and scrutiny prior to contract award or selection.
- The specialist contractor should be approved by the appropriate government agency.

Practical advice for managers

- Take steps to eliminate or at least minimise the risks.
- Every employer undertaking work with ionising radiation will require an overall radiation protection programme which, in most states, must meet the specific requirements from legislation.
- Workers must be provided with sufficient information and training to enable them to understand the importance of restricting exposure and the specific control measures which should be adhered to.
- Advice from the appropriate radiation advisers must be sought when designing new work tasks, equipment or plants with a risk of exposure to ionising radiation.
- Keep records.
- Ensure time and distance shielding measures are in place.

Signs and symptoms

There are few early symptoms of radiation sickness. Symptoms of the later stages include the following.

- Nausea and vomiting
- Diarrhoea
- Exhaustion, fainting
- Redness, tenderness, swelling of areas
- Hair loss
- Ulceration of the mouth, oesophagus and intestine
- Bleeding from nose, mouth, and rectum
- Sloughing of skin and open sores

Preventative or protective measures for workers

- Never cross a barrier displaying a trefoil — it is set at the safe distance.

- Look out for overhead walkways where scatter could occur.
- Where appropriate wear a film badge for regular monitoring.
- Never put yourself in a position where you MIGHT be exposed to radiation.
- Radiographic operatives to observe ALL precautionary measures at ALL times.
- Keep records up to date.

Health surveillance

National legislation may impose a requirement for the health surveillance of workers exposed to ionising radiation. For example, the relevant legislation in the UK is Regulation 16 of the Ionising Radiations Regulations 1985. These Regulations require that the medical surveillance shall include the maintenance of records of the doses received (an Approved Dosimetry Service) and a medical examination by an 'employment medical adviser' or an 'appointed doctor'. Each worker shall submit to a medical examination annually (or sooner if required by the doctor).

Restrictions may be placed on the worker by the medical practitioner with regard to the type of work or the levels of radiation to which he may be exposed. The protocol of the medical examination shall be determined by the medical practitioner but the minimum level of information to be recorded is prescribed in legislation. In the UK, records of doses received and medical surveillance shall be retained for fifty years.

3.10 Heat stress and strain

Heat strain is the physiological or pathological change resulting from heat stress, e.g. increase in heart rate and body temperature, sweating, salt imbalance.

3.10.1 Risk indicators

- Workers in an environment where the combined effects of the temperature, humidity and rate of air movement result in a need to restrict both the time and level of exertion of persons required to enter that environment.
- Workers with prolonged exposure to direct sunlight.

Examples of high-risk activities or processes

- All outdoor activities in hot weather.
- All internal activities in a hot environment.

3.10.2 Health risk management

Pre-employment assessment

A pre-employment medical examination is very important for the placement of a worker in hot environments. This examination should take into account the physical condition of the worker (cardio-vascular, renal, endocrine and respiratory systems, age and sex).

Practical advice for managers

- Carry out risk assessment and identify, assess and manage the risk of heat stress/strain (temperature, humidity and airflow). Seek specialist advice where necessary, e.g. special PPE (water-cooled suits, reflective clothing), drinking water (and salt) requirements.
- Take steps to eliminate or at least minimise the risks.
- Ensure supervisors and workers appreciate the dangers of excessive exposure to heat and are fully trained and motivated in control measures, e.g. clothing, drinking water frequently, rest breaks. Example 3.10.1 is an extract from M W Kellogg's Field Health, Safety and Environment Handbook covering work in hot environments.
- Refer at-risk workers to occupational health professionals, for health surveillance. They can also be proactive in educating and training supervisors and workers.
- Consider engineering factors to prevent heat stress/strain, e.g. increasing air movement (opening doors, windows, installing fans), shielding sources of radiant heat and insulating hot areas.
- The provision and identification of adequate cool rest areas, cool drinking water points, drinking containers, shower units, changing areas, etc.
- Provision of suitable protective clothing (which workers are required to wear).

Signs and symptoms

- Heat exhaustion/water depletion — thirst, weakness, fatigue, giddiness, nausea, headache, pale and clammy skin, sweating and dry mouth. Vomiting and loss of consciousness may occur.
- Heat cramps — painful muscle spasms following hard physical work.
- Heat rash (prickly heat) — a red itchy rash.
- Heat stroke is the most serious health problem associated with hot working conditions. It can result in drowsiness, headache, confusion, delirium, aggressiveness, convulsions and eventually unconsciousness. The skin is usually dry and red or spotted. Early recognition and treatment are essential to prevent death.

Example 3.10.1
Precautions for work in hot environments

GENERAL PRACTICES — WORK IN HOT ENVIRONMENTS

EXTRACT FROM M W KELLOGG'S *FIELD HEALTH, SAFETY AND ENVIRONMENT HANDBOOK*

In hot countries and/or environments such as confined spaces or work carried out in sealed suits you must drink water frequently, ideally about a litre an hour. It is vital you keep your body hydrated as heat over just a couple of hours will kill.

If sealed suits are used, ensure that they are cooled. If this is not possible, take frequent breaks.

When fire retardant suits are used, frequent breaks are vital as your body will overheat quickly.

It is recommended that you avoid alcohol and caffeine as these will only worsen the problem.

Clothing can also help — breathable fabrics (e.g. cotton) will help your body stay cool.

Source: M W Kellogg Ltd

Preventative or protective measures for workers

- Take regular rest breaks (ideally in a cool environment) and cool drinking water when conditions are hot (even if thirst is not compelling). An additional salt intake is normally not necessary unless the diet is poor in salt or there is extreme sweating. Sponging the body with tepid water will increase cooling.
- Take adequate overnight rest in a relatively cool environment away from the workplace.
- Wear suitable protective clothing depending on the main source of heat, i.e. thick for conductive heat, white for radiant heat, and minimal for humid conditions.

Health surveillance

The effects of working in conditions leading to heat stress or strain are an increase in heart rate combined with loss of salts (electrolytes) due to sweating. It is therefore recommended that any individual who may be exposed to such conditions should be subjected to a physical examination by the doctor. The doctor may need to exercise judgement in specific instances depending upon the severity of conditions, duration of

exposures and tasks to be undertaken. In particular anyone suffering from any heart condition should not be permitted to expose themselves to conditions of heat stress or strain.

3.11 Ultraviolet radiation

Construction workers are mainly exposed to ultraviolet radiation by working in direct or reflected sunlight. Significant exposure can lead to skin cancer.

3.11.1 Risk indicators

All workers with extended and excessive exposure to ultraviolet light from the sun due to working outdoors for a significant part of the day are at-risk.

Examples of high-risk activities or processes

- Fair-skinned workers are at particular risk, but all exposed workers are at some risk.
- Some chemicals, e.g. wood preservatives, can increase sensitivity to the sun.
- Reflected sunlight may affect workers vision, e.g. industrial roofers, concreting and external painting.
- All outdoor activities, etc.

3.11.2 Health risk management

Pre-employment assessment

Education of at-risk workers regarding the preventative measures under their control which can help reduce the risks of skin cancers can be covered as part of the pre-employment assessment. Individuals at particular risk, e.g. those fair skinned, red haired, taking certain medications and with many existing moles, can also be identified and encouraged to take particular care.

Practical advice for managers

- Specific risk assessments should be conducted addressing the unique requirements of the task, the individual, location, duration and climate.
- Take steps to eliminate or at least minimise the risks.
- Encourage a change in supervisors' and workers' behaviour by

explaining and reinforcing control measures for workers whilst exposed to the sun, e.g. discourage the removal of clothing.

- A typical toolbox talk is given in Example 3.11.1. This also covers other risks from outdoor activities.
- Train supervisors and workers to check their skin regularly and report any skin spot/mole which they are unsure about.

Example 3.11.1
Typical toolbox talk for working outdoors

WORKING OUTDOORS

Some people are attracted to construction work because the outdoor life is preferred to the factory or office environment. However, extremes of weather can take the gilding off unless we know how to cope.

The Health and Safety at Work Act requires employees to take reasonable care for themselves and others. This includes coping with the weather. The PPE Regulations also refer to 'exposure' and this also implies the weather.

Working in Cold Wet Weather

1 Rheumatism can be brought on or aggravated by allowing joints and limbs to be cold and wet for long periods. Treatment is difficult so prevention is best. Waterproof clothing which is big enough to allow adequate warm garments to be worn underneath should be worn (especially applies to boots).
2 Bronchitis is a development of a cold brought on by exposure to cold and damp. Once affected it is easily caught again and can get worse until you are virtually disabled. Smoking makes the chance of catching it even greater.
3 If working in water, e.g. a trench or other place where wading is necessary, even good boots and socks can eventually allow the feet to be blue and numb. Do not stand in water for too long and, if possible, change socks for a dry warm pair at intervals.

Work in Cold Dry Weather

1 Working in intense cold can slow you down physically and mentally. Reactions are slower and decision making over even simple things become harder. Hence accidents are more likely.
2 In extreme weather conditions, if possible arrange a work rota system so that regular periods are spent out of the cold and wind.
3 Hypothermia usually occurs when you can no longer maintain your body temperature at about 37 °C. Shivering is usually the first sign, but some people do not seem to shiver. If you begin to feel cold 'deep inside', refer to your foreman/chargehand and take a short break in a warm place. Have a warm drink and snack during your breaks!
4 Chill factor is the added effect of wind on the body that makes it seem colder than the thermometer actually reads. At 0 °C and 20 mph wind, the chill factor may make it seem like 10 °C, so extra protection is called for.
5 Chilblains, frostbite and skin damage are not confined to Arctic explorers. They are extremely painful and disabling so prevention is better than cure. Warm gloves and socks are essential but if you can feel your extremities getting too cold, change to a warm dry pair. Protective creams are available for face and wrists, etc. to replace the natural oils dried up by the cold and prevent cracking and peeling.
6 Where necessary, temporary shelter should be constructed. This will almost certainly pay for itself by improving productivity. Sheeting over scaffolding, tents, or even working in the lee of the site hut are possibilities. Somewhere warm and dry to take refreshments and dry clothes is required.
7 Long sleeved vests, long-johns, thermal underwear, etc. may be the butt of jokes but if they keep you warm, it is better to be laughed at for a few minutes than unhealthy for the rest of your life.

Work in Hot Weather and Conditions

1 Sunburn is very common, very painful, but easily avoided. Glare from an overcast sky can also cause burns on sensitive skins. Stripping off too hastily or for too long is unwise, especially for fair skinned people and near midday. Ultraviolet light causes premature ageing (wrinkling) of skin and increases chances of skin cancer. Thinning of the ozone layer in the upper atmosphere is allowing more ultraviolet through. Sun blocking lotion is recommended but take account of how long you will be in the sun; a high protective index is probably required.

2 Prickly heat is brought on by working in hot conditions. It causes groups of small itchy spots on the skin. Frequent washing to remove sweat, wearing loose cotton clothes and, if possible, periods of work out of the hot location are advised.

3 Heat exhaustion is the combination of high temperature, exertion and loss of fluid and salt through sweating. It can be dangerous if not recognised. Fainting, cramp and nausea can overcome the unwary. Frequent rests and plenty of cool, but not iced, drinks are necessary.

Any Questions

Summarise main points

Source: HVCA

Signs and symptoms

- A reddening of the skin (sunburn) follows exposure to direct sunlight. This may lead to soreness and blistering.
- Other effects of overexposure include premature ageing of the skin, pigmentation, acute burns and photosensitivity.
- Acute and chronic injury may be caused to the eye.
- Prolonged exposure of the skin can increase the risk of developing skin cancer (malignant melanoma) which can lead to death.

Preventative or protective measures for workers

- Protect all exposed skin surfaces with ultraviolet blocking creams.
- Protect your eyes with dark glasses, preferably designed to avoid both direct and peripheral exposure of the eye.
- Do not remove clothing whilst working outdoors particularly when the sun is at its hottest, i.e. the four hours around noon. Wear long sleeved shirts and trousers. A safety helmet with a hanging flap at the back to protect your neck will give some protection from the sun.
- Avoid the skin reddening which is the first sign of burning.
- Check your skin, especially the face and backs of hands. Get medical advice if you notice a small, scabby spot that does not clear, any changes in existing moles, any new moles or skin discoloration. Treatment is easier if detected earlier.

Health surveillance

Health surveillance by a health professional will not be appropriate except in the most extreme circumstances. However those individuals likely to be exposed to ultraviolet radiation should be advised of the hazards, the precautions and the symptoms. They should be encouraged to examine themselves for such symptoms and advised of the appropriate action.

3.12 Hyperbaric conditions – decompression illness

As well as decompression illness (DCI), hyperbaric health problems include burst eardrum and ear infections, burst lung, oxygen poisoning and carbon monoxide poisoning.

3.12.1 Risk indicators

Hyperbaric-related health risks are inherent in any work in an increased pressure environment. A worker in increased ambient pressures (or depth) absorbs more gas into the body via the lungs. As this pressure is reduced, the extra gas absorbed is released. During decompression (ascent or reduction in pressure) bubbles may form in the bloodstream but under normal circumstances they are so small as to be insignificant. However, if through error or an accident, an ascent is too rapid, or there is a sudden decrease in pressure, the bubbles increase in size, exerting pressure on surrounding tissue which may become damaged and interfere with the blood supply. Bubbles are regarded in the body as electro-kinetically active and cause most of their effects by blood vessel and blood vessel wall damage.

Examples of high-risk activities or processes

- Air range divers (inland, inshore, offshore)
- Mixed gas divers (predominantly offshore)
- Workers in a compressed air environment of between 0.25 bar and not exceeding 3.5 bar above ambient air pressure, e.g. tunnel workers

3.12.2 Health risk management

Pre-employment assessment

Prior to commencing work and periodically thereafter, workers must undertake a medical examination to verify their overall fitness to work in a compressed air environment. Only a registered physician who has been appointed by the authorities to carry out such examinations and issue certificates of fitness should carry out such examinations.

N.B. The European Diving Technology Committee (address given in §A1.2 in Appendix 1) has agreed competencies for the training of doctors in this field to act as medical examiners of divers, and, for operational diving, as diving medical specialists.

Practical advice for managers

- Only specialist contractors who can demonstrate competence and capability to comply with the regulations should be appointed. Diving contractors must be registered with the appropriate authorities.
- Ensure contractors have carried out risk assessments and communicated the results to all workers.
- Take steps to eliminate or at least minimise work at pressure.
- Ensure contractors have developed detailed procedures (diving project plan) and have contingency plans in place, in accordance with national legislation, where applicable.
- Diver logbooks should be available for inspection, and maintained daily, as should logs for those persons working in compressed air.
- Evaluate each project, and ensure a sufficient number of competent persons are present on site to supervise the work and provide medical assistance. For work in a compressed air environment above 0.07 bar and diving, this includes adequate facilities for medical treatment. For example, a medical lock (therapeutic recompression chamber), a competent person to operate the lock; and suitable persons competent to provide medical assistance in respect of any conditions arising from the work. These facilities must be maintained for 24 hours after the suspension of work.
- Develop contingency plans, which must include the notification of the work to the emergency services (hospitals, ambulance and fire services), or any other establishment in the vicinity that has an operable medical lock (e.g. the Navy).
- Ensure sufficient equipment is available to carry out the work safely, and that it has been examined and tested prior to work commencing. Also, a competent person should execute maintenance and testing schedules, and records maintained.
- Breathing gas storage cylinders (and where appropriate piping), should be colour coded and marked to European and national standards.
- Flying/travelling should be considered in the risk assessments. Flying should not be undertaken for 24 hours after working under pressure or diving.

- If there is to be travel over mountains within 24 hours of working under pressure or diving, the altitude change must be considered and reference made to the approved decompression tables.

Signs and symptoms

Diagnosis of DCI is urgent and is the responsibility of trained personnel within the diving or tunnelling workforce, answerable to a specific doctor. Symptoms are usually classified according to the body tissue affected and may include the following.

- Joint pains, particularly the large joints of the knees and shoulders
- Skin irritation, e.g. rashes, itching, mottling
- Numbness, tingling, weakness or paralysis
- Visual disturbances
- Abdominal pain, vomiting and diarrhoea
- Loss of bladder/bowel control
- Confusion
- Convulsions
- Unconsciousness

Symptoms (like the above) can dramatically affect a victim's judgement. The companions of a victim suspected of suffering from decompression sickness should therefore be wary of the victims' assessment of his own condition. It is not unknown for seriously affected victims to refuse to believe that there is anything wrong with them.

Symptoms vary and can occur anywhere from a few minutes to many hours afterwards. Generally, the shorter interval is associated with short deep dives or severe illness and the longer intervals with longer exposure to lower pressures or mild illness.

Decompression sickness affecting the bones, known as bone necrosis, is a long-term problem, which can affect divers and caisson workers. Bone necrosis is the death of areas of bone, and results in painful disability. It is usually the result of persistent inadequate decompression, but can occur even though all procedures have been correctly followed. It is more common in those who have had decompression illness.

Preventative or protective measures for workers

- Ensure that your certificate of fitness is current.
- Do not work in increased pressure environments, or dive when

suffering transient medical conditions, particularly affecting the lung or nasal passages.

- Anything which can affect your physical condition such as seasickness, obesity, dehydration or a hangover, should also be taken into consideration.
- Plan carefully, and use recognised decompression tables to establish depth/times or pressure/time periods.
- Cumulative effects of working under pressure must be considered when you work over a number of days, even when working within the parameters of the decompression tables.
- Position compression air intakes so that they draw clean fresh air and are well away from exhausts.
- Keep air compressors well maintained, and check the quality of the compressed air supply regularly to ensure that there is no oil carryover, and carbon monoxide levels are below 5 ppm. These checks must be to an established schedule and must be recorded.

Health surveillance

National legislation may impose a requirement for health surveillance for those workers who are to work in a compressed air environment. For example, diving operations in the UK are subject to the Statutory Instrument 1997 No 2776 the Diving at Work Regulations 1997. These regulations require the appointment of an 'employment medical adviser' or an 'appointed doctor' to supervise the medical surveillance of the workers and to authorise them to undertake the work.

The requirements for medical surveillance and supervision vary in accordance with the pressure to which the worker is exposed. Workers who are exposed to pressures in excess of 1250 mbar are required to undergo a medical examination prior to being authorised to enter the working environment and thereafter at least every four weeks. The worker may be precluded if they have a cold, sore throat or earache.

The medical practitioner may limit the pressure to which any worker may be exposed and the duration between medical examinations.

3.13 Leptospirosis (Weil's disease)

Various infectious diseases affect construction workers. Some are more prevalent in certain geographical areas. In Europe, leptospirosis is one of the most common construction-related infectious diseases. Leptospirosis

(or Weil's disease) is a bacterial infection carried in rat's urine, which contaminates water and soil.

3.13.1 Risk indicators

Non-stationary or transient workplaces, where several companies and disciplines are involved, may lead to a higher number of foreseeable as well as unforeseeable deviations from standard procedures. This may reduce the effectiveness of technical and organisational protective measures against leptospirosis and similar risks.

Examples of high-risk activities or processes

- Workers in contaminated land or water
- Excavation in the vicinity of ditches and ponds
- Sewerage workers
- Waste management workers
- Carpenters and joiners
- Riggers/pipe fitters (underground pressure pipes)

3.13.2 Health risk management

Pre-employment assessment

This is an acute rather than a chronic condition and therefore effective pre-employment assessment is difficult. As a sensible precaution individuals whose health may already be compromised should not be exposed to the additional risk.

Personnel with impaired kidney function or existing skin conditions, e.g. eczema, may be particularly vulnerable.

Practical advice for managers

- Assess likelihood of exposure or extent of work in contaminated areas.
- Take steps to eliminate or at least minimise the risks.
- Ensure provision of adequate washing/showering facilities.
- Encourage a change in supervisors' and workers' behaviour by reinforcing control measures for exposed workers, e.g. washing hands, covering cuts and grazes.
- Train supervisors and workers to recognise the early symptoms and to take prompt action.
- Involve your occupational health physician in compiling an information card such as shown in Example 3.13.1.

- Workers exposed to leptospirosis are also in danger of contracting Hepatitis A. It is recommended that they are vaccinated against Hepatitis A.
- In addition, all workers should be vaccinated against tetanus.

Signs and symptoms

- The most common early symptoms are a sudden high temperature, an influenza-like illness and joint and muscle pains. Conjunctivitis may be present.
- Jaundice may also be present.

Preventative or protective measures for workers

- Wash or shower thoroughly after working in stagnant or slow moving water and soil.
- Wash your hands regularly and always before taking any food or drink.
- Avoid rubbing your nose, mouth or eyes with your hands during work.
- Cover cuts and grazes with waterproof plasters.
- Wear protective clothing, e.g. gloves, waders, to avoid cutting/grazing the skin.
- If you have a flu-like illness and have regular contact with stagnant water, soil or sewerage, consult a doctor or local hospital. Tell them about your work.

Prompt action is vital; serious illness or even death can result.

Health surveillance

This is an acute rather than chronic condition and therefore health surveillance is not appropriate. Immunisation or propylaxis may be appropriate for periods of high exposure. An individual exposed to the risk should be advised to inform their own medical practitioner in order to assist early diagnosis.

Example 3.13.1
Information for a pocket 'Medical Instruction Card' for Weil's disease to be carried by workers

INSTRUCTIONS TO STAFF WORKING IN CONTACT WITH SEWAGE POLLUTED WATER OR IN DITCHES & RAT INFESTED PLACES

Whenever you go to your doctor or to a hospital on account of illness, show this card and make sure that those attending you know your occupation.

Name .....
Address .....
Employer .....
Employment .....

THIS IS FOR YOUR PROTECTION

Your work involves contact with sewage and water which may be contaminated by rats. Most rats in this area excrete a germ in their urine which can enter your body through any scratch cut or prick in your skin and cause a serious disease called leptospirosis (Weil's disease).
You should avoid getting cuts and scratches but if you do they must not come into contact with polluted water. You should wear waders and gloves when working whenever possible.
The germ can also enter the body through the eye and lips so you should therefore avoid splashing polluted water onto your face.

Since sewage frequently contains other dangerous germs you should also take care to wash thoroughly after working, before eating or drinking and also before smoking a cigarette. Remember that nothing which has touched sewage should be allowed to touch your lips and this includes your fingers unless they have been thoroughly washed.

Precautions

1. Wear gloves and waders when working in sewers and polluted ditches.
2. Avoid getting cuts or scratches.
3. If you get a cut or scratch, take all reasonable steps to avoid immersing it in polluted water.
4. Wash thoroughly after work. Wash again before eating.
5. Do not eat or smoke while you are working in sewers or ditches or after working until you have first washed yourself.
6. If you develop an illness which starts like a severe influenza consult your doctor and show this card. Delay may be dangerous.

Information for Medical Practitioners

Leptospirosis generally commences as a febrile illness, which may be accompanied by one or more of the following: muscular pains and tenderness, headache, nausea, conjunctival injection, hepatomegaly and petechiae.

About 50% of cases develop jaundice from the fourth to the sixth day. Proteinuria usually develops and casts may be present. Leucocytosis with neutrophilia is the rule.
In the early stages, leptospirosis is often mistaken for influenza, atypical pneumonia, tonsillitis, glandular fever, meningitis and later for viral hepatitis.
This diagnosis must be confirmed by serological test. The rapid and severe exacerbation of the illness sometimes follows mild initial symptoms and it is always advisable to send suspected cases without delay into hospital for investigation and treatment. Penicillin is the drug of choice but this must be given within four days of onset to be of any value.

Source: National Power plc

3.14 Problems caused by materials hazardous to health

Modern construction companies increasingly use construction materials from the chemical sector. This results in numerous problems for employee safety and health. At the same time, both the authorities and the clients in the construction industry attach great importance to health and environmentally compatible materials.

Since the workplaces in the construction industry are largely non-stationary and subject to continuous changes, the possibilities of implementing technical and organisational measures to protect the workers from hazardous materials are rather limited. As several companies and different disciplines cooperate, the implementation of technical or organisational protective measures against the effects of hazardous materials will never be as effective as is the case in stationary workplaces.

The EC Directive 67/548/EEC of 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances can be seen as the key document. Many chemical substances classified as hazardous substances under this Directive within the European Union are listed in Annex I, which is regularly updated. The classifications and labelling covered in this section are valid throughout the entire European Union and do not require further checking by the individual Member States. The Directive also includes the basic regulations on the packaging of hazardous substances. In the meantime, the Directive has been updated twenty five times to adjust its content to the technical progress that has occurred.

3.14.1 Risk indicators

Examples of high-risk activities, processes or products

- Bitumen and bitumen products
- Concrete work
- Epoxy resins
- Formwork release oils and releasing agents
- Facade cleaning
- Flooring work
- Glass cleaning
- Isocyanates

- Oils and lubricants
- Paint removal, pickling
- Paint work
- Stone conditioners and stone impregnating agents
- Synthetic mineral fibres
- Tiling work
- Timber (parquet) flooring
- Timber preservation

Due to the variety of activities, processes and substances involved in this area, guidelines have been provided in Appendix 18, along with specific signs and symptoms and practical advice.

3.14.2 Health risk management

Pre-employment assessment

Pre-employment assessment by medical examination can determine to some extent individuals who are at-risk, e.g. those with previous skin or lung diseases. Individuals with other allergies can thus be identified and encouraged to take particular care.

Practical advice for managers

- There is extensive legislation in most countries covering the use of substances hazardous to health.
- Consult an expert on workplace safety and an occupational health physician for advice on hazardous substances and ask for assistance in staff training.
- All activities should be included in a hazard analysis framework involving the handling of hazardous substances and mixes.
- Take steps to eliminate or at least minimise the risks.
- Wherever possible less hazardous substitutes should be chosen or the handling procedure changed. Only after these steps have been taken should any technical, organisational and personal protective measures be initiated.
- Information in the form of safety data sheets or operating instructions must be available on site on all substances or mixes.
- Ensure that awareness of hazardous materials is communicated to all personnel. Example 3.14.1 is an extract from M W Kellogg's Field Health, Safety and Environment Handbook.
- Preventative health checks are required when handling certain hazardous substances. These substances must be defined and the preventative health checks implemented.

- Train supervisors and workers in:
  - Preventive measures
  - Proper use of PPE
  - Recognition and reporting of early signs and symptoms of any adverse effects caused by hazardous materials
- Appropriate ventilation of work areas must be provided.
- Suitable PPE must be available but should not be used as a first action. Hazards should be 'managed-out' wherever possible.
- Suitable first aid equipment must be available and the training of first aid personnel must be ensured.
- Adequate washing facilities and cleaning procedures for protective clothing (unless disposable) must be provided.

Signs and symptoms

Signs and symptoms for the ill effects of some of the more common hazardous materials are described in Appendix 18.

Preventative or protective measures for workers

- Always use a barrier cream to top up the 'surface lipid film' of your skin.
- Wherever possible avoid any contact with construction chemicals.
- Wherever possible use tools or equipment to handle the substances.
- Aim to keep the workplace, equipment and PPE free from contamination.
- Wash contaminated skin immediately. Use purpose skin cleaners, no chemicals like spirit, turpentine, benzene or fuel.
- Always consult a first aider upon contact with hazardous substances on the skin or eyes or when feeling unwell after inhaling hazardous vapours and report to your supervisor.
- Seek information on the hazardous characteristics of construction chemicals from any instructions and during safety training. Ask if you are not given sufficient information.
- Always wear the PPE provided by your employer, e.g. protective gloves, goggles or breathing masks.
- Inform supervisors, health and safety officers or safety engineers without delay if PPE is not available or in inefficient working order.

Health surveillance

Health surveillance depends on the specific hazardous materials used on the construction site. Specialist advice and assistance should be sought from occupational health physicians.

Example 3.14.1
General briefing on handling hazardous materials

CHEMICAL AWARENESS

EXTRACT FROM M W KELLOGG'S *FIELD HEALTH, SAFETY AND ENVIRONMENT HANDBOOK*

The safe handling of chemicals that are considered hazardous in Europe and North America is governed by strict regulations and codes of practice. Special procedures are specified and Material Safety Data Sheets (MSDS) are made available in these countries. Use these sheets so that all precautions to be taken when handing individual chemicals are known.

In some countries these procedures and regulations are not in place or may not be adopted by the client. Under such circumstances, adopt the M W Kellogg Ltd standards and procedures for safe handling of such chemicals. Use the Material Safety Data Sheets for all the chemicals present at the jobsite.

Understanding the hazards and physical properties of a chemical and adopting the safety precautions necessary for each chemical handled in the plant will assist in ensuring employee safety for the duration of your assignment at the jobsite.

Source: M W Kellogg Ltd

3.15 Lifestyle, alcohol and drugs

These are issues that extend well beyond the boundaries of the workplace but may affect an individual's work and working environment. Issues such as physical fitness, weight and those relating to emotional and psychological stress are outside the scope of this document.

The EC Directive on the Organisation of Working Time does set out requirements on the length of the working week, extent of paid leave and mandatory rest periods. This Directive and the resulting national legislation will have an impact upon the health of the workforce, particularly in the area that could loosely be termed 'lifestyle'.

This section concentrates on the misuse of alcohol or drugs. There is no specific legislation dealing with this at the workplace. Each country has its own regulations concerning the control and use of the substances mentioned in the following paragraphs.

3.15.1 Risk indicators

Personnel at all levels within the construction industry are as susceptible to suffer from alcohol or drug abuse or dependency as those from other industries.

Examples of high-risk activities or processes

Health risks associated with lifestyle, alcohol and drugs can affect any person.

3.15.2 Health risk management

Pre-employment assessment

- Pre employment medicals can help detect any potential employees who may be involved with alcohol, drugs or solvents.
- Personnel at all levels can be involved in alcohol, drug or solvent abuse.

Practical advice for managers

If personnel are encouraged to lead a healthy lifestyle by employers then those employers will benefit by having a more healthy and reliable workforce. Forward-looking clients are now increasingly encouraging construction and maintenance personnel to use their direct employees' welfare and recreational facilities.

A responsible employer ensures employees have physical examinations both as a pre-employment exercise and on a regular basis. The medical practitioner conducting such examinations could detect any signs of dependency if the tests were done. Currently in some countries, such as the UK, specific testing for alcohol, drug or solvent abuse is not mandatory. However, in the USA such testing is accepted throughout the construction industry. There is considerable debate in many countries regarding the efficacy of this approach.

Responsible employers are now seeking to address this area in a number of ways such as:

- Providing free confidential counselling to employees, who admit to their involvement with either alcohol, drugs or solvents.
- Training supervisors to help them identify potential problems.
- Educating the entire work force about the harm that alcohol, drugs and solvents can cause.
- In the event of personnel being suspected of being under the influence, responsible employers have even gone to such lengths as to have an external independent medical laboratory conduct the testing for them. If proved positive the employers offer counselling and help. It is also becoming more widespread to find random breath testing as

personnel enter an operational site, particularly where there is an ongoing industrial process.

Signs and symptoms

In the early stages it is not easy to spot if someone is taking drugs, sniffing solvents or suffering from alcohol abuse — there are no obvious early signs or symptoms. The most important point to remember is not to jump to conclusions. The usage of such substances can and does impair the performance of individuals as well as having the potential to create serious unsafe conditions for the affected employee and the plant and personnel around them. Listed below are some of the more common signs of misuse or dependency that may become apparent to an employer.

- Sudden and frequent changes of mood
- Unusually aggressive behaviour
- Loss of appetite
- Gradual loss of interest in, friends, colleagues, hobbies, etc.
- Uncharacteristic drowsiness or sleepiness
- Increasing evidence of lying or furtive behaviour
- Loss of money or other objects from colleagues
- Impaired job performance
- Increased sickness absence level

Do not expect to find drugs lying around the site. You may however find evidence of usage, such as:

- Scorched pieces of tinfoil
- Spent needles or syringes
- The remains of cigarettes with small cardboard tube filters
- Empty alcohol containers
- Liquid petrol containers.

4. Control measures and influencing factors for effective occupational health management

Having considered the actions required at various project stages in Chapter 2 and the major health risks in Chapter 3, this chapter now introduces the main control measures and influencing factors for effective health management. These are:

- Risk assessment
- Human factors/ergonomics
- Role of the specialists and professionals
- Medicals, health assessments and health surveillance
- Health and welfare facilities
- Industrial hygiene
- Training and information.

4.1 Risk assessment

Risk assessment is of fundamental importance in health management, particularly with regard to correctly targeting and prioritising work activities/processes of concern. There is no numerical formula for a risk assessment, i.e. evaluating a risk. Clients and contractors must develop their own method. For example, the construction publications *Croner's Management of Safety* (Croner 1995) and the ECI/PowerGen *CDM Regulations — A Design Risk Assessment Manual* (PowerGen 1996) contain illustrations of the process for conducting a risk assessment. Readers who require more information on this subject should consult these documents.

The following steps for risk assessment are based on the EC document (EC 1996) *Guidance on Risk Assessment at Work.*

Collect up-to-date information

- Known health hazards for construction activities
- Relevant standards, rules and regulations
- Effective protective/control measures
- Feedback from workers and supervisors regarding perceived health risks

Carry out a survey

- For example, observation, workplace inspections, work organisation and special health hazards/risks.
- Use checklists relating to possible health hazards and the appropriate protective/control measures.
- Use checklists in respect of the protective/control measures, which should be in operation for certain activities.
- Use data sheets with guidance for the control measures for chemical substances.
- Follow standards, rules and regulations.

Identify priorities

- Determine priorities based on site evaluation.
- Take account of the severity of the risk, the likely outcome, numbers of people affected and the time necessary to take preventative measures.

Consider whether outside experts should be brought in

- The manager should carefully evaluate his or her own competence to make a correct evaluation of the health risks and protective/control measures.
- If there is any uncertainty, steps should be taken to ensure the assessor acquires the necessary skills or a competent person should be brought in to assist.

Keep a record

The following details are a minimum:

- Name (and job title) of the assessor, date of assessment
- Undertaking department
- Workplace activity
- Health hazard or risk arising
- Requisite protection/control measures (with the relevant regulations)
- Details of the introduction of the requisite measures, e.g. name of person responsible for implementing, date
- Details of subsequent monitoring arrangements, e.g. dates of inspections.

Inform all persons concerned

All persons affected should be informed of the existence of the health hazard, of any potential health problems and of all requisite protective/control measures to prevent such problems.

Monitor compliance

As part of health risk management regular checks should be carried out to ensure compliance with protective/control measures.

4.2 Human factors/ergonomics

The word 'ergonomics' is derived from the Greek words *ergon* (work) and *nomos* (law). In the United States, the term 'human factors engineering' is often used. The science of ergonomics aims to design equipment/appliances, technical systems and tasks in such a way as to improve human safety, health, comfort, performance and well being.

In the design of work and everyday life tasks, the focus of ergonomics is the human. Unsafe, unhealthy, uncomfortable or inefficient situations at work or in everyday life can be avoided by taking account of the physical and psychological capabilities and limitations of humans. Construction work is made up of many tasks (e.g. digging, plastering, concrete work) and trades (e.g. carpenters, bricklayers, roofers), and ergonomists can act as catalysts to improvements in these work activities. A number of factors determine to a large extent safety, health, comfort and efficient performance in construction work, including:

- Body posture and movement (e.g. sitting, standing, lifting, pulling, repetitive motions and pushing)
- Environmental factors (e.g. noise, vibration, illumination, climate, chemical substances, dust)
- Information and operation (information gained visually or through other senses, controls, relation between displays and control)
- Tasks and jobs (e.g. monotonous jobs, stress, parallel work tasks).

The ergonomist will utilise information from many fields including anthropometry, bio-mechanics, physiology, psychology, toxicology, mechanical engineering, industrial design, information technology and industrial management. In applying this knowledge, specific methods and techniques are used. As a consequence of its applied nature, the ergonomic approach often results in the adaptation of the workplace or environment to fit people, rather than the other way round, i.e. by taking account of human capabilities and limitations when designing work and everyday life environments.

An important ergonomic principle is that equipment, technical systems and tasks are designed in such a way that they are suited to the user.

Health problems and accidents are often as a result of a 'mismatch' between operators/users and the task. As well as research and development into the design of construction tasks, a systematic ergonomic approach to problems can lead to practical and workable solutions. These, sometimes radical changes will help secure a safe and healthy future for the construction industry and its workers.

4.3 Professionals involved in occupational health management

Effective health management involves teamwork. Sadly, within many construction organisations health management is left up to the efforts of the line managers who are usually ill-equipped to take effective action. Forward-thinking organisations are using the following professionals to provide valuable inputs to occupational health management of construction workers.

The terms may vary for different countries. The individuals should hold relevant recognised qualifications in their field.

- Occupational health physicians:
  - Can diagnose work-related health problems.
  - Have overall responsibility for the management of health surveillance activities.
  - Carry out full medicals to ensure fitness for work.
  - Assist in the assessment of health hazards at work and advise regarding the management of those risks.
- Occupational health nurses:
  - Advise regarding work-related health problems.
  - Conduct health surveillance activities.
  - Assist in medicals to ensure fitness for work.
  - Assist in the assessment of health hazards at work and advise regarding the management of those risks.
  - Manage first aid facilities/service.
- Occupational hygienists:
  - Assess the workplace for chemical, biological and physical agents which may pose a risk to health.
  - Provide practical advice regarding the prevention or control of these risks.
- Ergonomist/human factors experts:
  - Are concerned with the relationship between the worker and the equipment, workplace, environment and the organisation within

which they work. They aim to achieve optimum efficiency, safety and well being of the worker.

- Provide practical advice regarding the design of work tasks to prevent and control work-related health problems, e.g. suitability of equipment, task design and suitability of PPE.

- Epidemiologists:
  - Advise on the design of epidemiological studies (data collection and records) for the study of health hazards at work.
- Specialists in legal issues:
  - *Ignorantia juris nemo excusat* (ignorance of the law is no defence). Therefore it is important to obtain proper legal advice regarding difficult cases, e.g. civil actions, disablement benefit claims and breaches of health and safety rules.
- Specialist engineering professionals:
  - *Noise engineers* provide advice regarding the control of noise in the working environment.
  - *Ventilation engineers* provide advice regarding the control of exposure to airborne health hazards, i.e. dusts, gases, vapours and fumes.
  - *Water treatment engineers* advise on the design and treatment of water systems to prevent or control the risk of waterborne contaminants.
- Radiation protection advisors:
  - Provide advice regarding any aspect of production methods, monitoring, risk assessment, regulations and environmental concerns.
- Microbiologist:
  - Sample and assess biological agents and micro-organisms.

Typical activities for an Occupational Health Service for a major construction project are given in Example 4.3.1.

Example 4.3.1
Typical activities of an Occupational Health Service

AN OCCUPATIONAL HEALTH SERVICE SHOULD INCLUDE THE FOLLOWING ACTIVITIES:

1. *The prevention of occupational disease by:*
   - Assessing employees and all materials, operations and processes with which they are involved at work
   - Assessing health risks before decisions are taken on investment in a new plant, processes and working areas (ergonomics)
   - Routine health surveillance targeted at specific personnel

2. *Fitness for work — placement and rehabilitation by:*
   - Rehabilitation advice following illness or injury
   - Pre-employment advice (and job changes) using clearly defined criteria, e.g. job descriptions
   - Taking management referrals, e.g. following absence

3. *Treatment at work by:*
   - Providing minor treatment or renewing dressings

4. *General health promotion by:*
   - Providing advice and counselling
   - General health screening
   - Identifying the needs and targeting individuals or groups on health issues such as diet, smoking, exercise, alcohol or stress, i.e. lifestyle

5. *Providing information, instruction and training on:*
   - Work practices
   - Top-up training for first aiders

6. *Keeping records:*
   - Health records, e.g. assessments, surveillance, audiometry
   - Medical records

7. *Liaison with other departments:*
   - Safety department
   - Safety committee
   - Training department
   - Personnel department

Source: Alstom Automotive

4.4 Medical assessment, surveillance, promotion and monitoring

This section is adapted from ***Health Surveillance at Work*** *by Steve Deacon. Deacon's book is a comprehensive review of health surveillance procedures for regulatory compliance and good management practice (Deacon 1995).*

4.4.1 Pre-employment medical assessment

Many employers wish to assess the health of prospective job candidates in order to form an opinion of their medical suitability and fitness for the proposed post. Pre-employment medical assessment can also help in assessing past medical and employment history to form an opinion on future work attendance. Job candidates who do not make a full and honest disclosure of these details may be liable to dismissal, for a period of two years after recruitment. Pre-employment medical assessments also benefit the employee by identifying health problems at an early stage.

A pre-employment medical assessment should be arranged prior to the offer of employment. Preferably this should be undertaken by the employer's occupational medical staff rather than the job candidate's general practitioner as this avoids any delays incurred through the job candidate exercising their right of access to the medical report.

There is no prescribed form of pre-employment medical assessment. The form of assessment may vary according to the type of business, vocational fitness criteria and workplace hazards.

Some general guidance points are as follows.

- A health assessment by questionnaire should suffice for most job applications. Medical examination may be required by law but may occasionally be undertaken if the job involves exposure to occupational hazards, requires a high standard of fitness or when the safety of other workers or the public is concerned.
- The health assessment should be appropriate to the job sought. Physical or mental standards that are not relevant should be avoided.
- There are few situations where pre-employment screening for infectious disease carrier states, evidence of drug abuse, or genetic conditions are indicated. Possible instances arise where public safety is involved, e.g. Hepatitis B carrier state in healthcare workers. Specialist advice should always be sought.

- Employers should not discriminate against disabled or handicapped applicants who meet the requirements of the job.
- Satisfactory pre-employment assessment normally enables entry into occupational pension schemes. However, where a job applicant has a significant medical disorder it will be necessary to seek specialist medical advice. The fund manager should inform the job candidate of entry criteria and fund rules to ensure fair assessment. This actuarial assessment should not be used to discriminate against disabled job candidates. However, actuarial assessment may be relevant to general employment considerations in the event that the employee has a much reduced life expectancy.

4.4.2 Occupational health surveillance

Periodical medical examination may be required by health and safety legislation. For instance, in the UK the 1961 Factories Act (amended by the 1972 Employment Medical Advisory Service Act) defines medical examinations as including 'pathological, physiological, radiological tests and similar investigations'. Medical examination of employees may be required, if, in the opinion of an Employment Medical Adviser (EMA), the health of employees may be injured by the nature of their work. In this instance, a written notice will be served on the employer specifying the time, date and place for medical examination. The examination must begin within seven days and the employer must provide suitable accommodation if the examination is conducted in the workplace.

A number of UK regulations prescribe the routine medical examination of employees working in specific occupations. Usually, the employee must undergo an initial examination, followed by periodic health surveillance at a prescribed frequency:

- Control of Asbestos at Work Regulations — 2 yearly
- Work in Compressed Air Regulations — Initial/3 monthly
- Diving Operations at Work Regulations — Initial/12 monthly
- Ionising Radiation Regulations — 12 monthly

Also, statutory medical examinations are required for certain occupations involving the safety of the public, including:

- Heavy goods vehicle drivers
- Public service vehicle drivers.

Where participation is required under statutory provision, it may be appropriate to include the requirement for compulsory health surveillance within the 'terms and conditions of employment'. Employers will need to consult with employees and their representatives when introducing such routine occupational health surveillance procedures. Management arrangements should be agreed for dealing with employees who develop abnormal health assessment results.

All statutory medical examinations must be undertaken by an EMA or a medical practitioner appointed by the authorities (the HSE in the UK). Quality control procedures should be established to ensure the accuracy and precision of health surveillance measurements.

Occupational disease detected during routine surveillance must be notified to the employer who will then notify the appropriate authorities.

4.4.3 Health promotion

Many employers provide health surveillance procedures as employment benefits. Senior managers may be offered periodic health assessments by specialist medical contractors. A large range of options are available commercially and range from the clinical examination to fitness assessments using a running test on a treadmill. These are costly and tend to be offered only to the most senior managers whose strategic business importance is a basis for selection.

However, many occupational health services offer regular health checks to all employees. These are usually administered by an occupational health nurse with appropriate referral to an occupational health physician or the employee's general medical practitioner. The content of health promotion checks tends to focus on cardiovascular health risks with provision of information on diet, exercise and smoking cessation to encourage healthier lifestyle habits.

In addition, cancer screening services for female employees are sometimes provided to offer cervical and breast cancer screening in the workplace. This has the benefits of convenience for working women and overcoming apprehension through peer support. It is essential that arrangements are made for the results of these screenings to be supplied to the employee's general practitioner.

4.4.4 Sickness absence monitoring

Employers are concerned to establish good patterns of attendance by their employees for operational efficiency and cost constraint. This is a line management responsibility. Occupational health practitioners should not normally become involved in management surveillance and control of short term sickness absence. However, occupational health practitioners are required to advise employers and employees about medical problems which affect attendance and fitness for work. In the first instance this may be informal, but in the event of a sickness absence review (forming part of a formal management procedure, such as in the disciplinary process), then the assessment will normally be arranged at the written request of management with the agreement of the employee.

Repeated short absences for unrelated medical conditions is a matter of 'conduct' whereas longer periods of absence for related medical conditions is a matter of 'capability'. In the event that it is necessary to liaise with the employee's general practitioner, the written consent of the employee must be gained. The employee may exercise his or her right of access to the general practitioner's medical report prior to disclosure. Similarly, the employee should be informed beforehand of the content of any occupational medical report to management.

Periodical review of employee sickness certificates is one method to monitor and detect medical conditions of possible occupational origin.

4.5 Health and welfare facilities

Good health and welfare facilities will not only reduce the health risks but also improve productivity and performance of the workforce. Member States have guidance documents relating to health and welfare facilities and their provision on construction sites. The extent of the facilities will depend on the nature and location of the project, risk assessment, number of personnel and proximity of other primary health care facilities.

Example 4.5.1 is a based on a construction information sheet provided by the UK's HSE offering best practice guidance for the provision of welfare facilities at fixed construction sites.

Example 4.5.1
Provision of welfare facilities at fixed construction sites

PROVISION OF WELFARE FACILITIES AT FIXED CONSTRUCTION SITES

Extracted from UK HSE Information Sheet 18

Introduction

Construction site workers need adequate toilet and washing facilities, a place to warm up and eat their food and somewhere to store clothing. However, these basic requirements are often neglected. Good facilities can have a positive benefit on health and wellbeing and can help prevent dermatitis.

This information sheet is aimed at employers and the self-employed in construction and those in control of construction sites. It describes the minimum welfare facilities which should be provided or made available on fixed construction sites to comply with the UK Construction (Health, Safety and Welfare) Regulations 1996.

Duties

If you have overall control of the site, you are responsible for making sure that legal requirements for welfare are met for the site. In practice, this means the principal contractor or other person in control of the site will often either provide or arrange for common facilities for everyone.

If you are an employer or are self-employed, you need to ensure that everyone working under your control is either provided with or has access to suitable welfare facilities. This will need to be agreed with the person who has overall control of the site.

If work is carried out in occupied premises, e.g. offices, factories, etc. it may be possible to make arrangements with the client to use the permanent facilities at the premises.

Planning

- Make sure welfare arrangements are clearly addressed in the health and safety plan, where the Construction (Design and Management) Regulations (CDM) apply.
- Consider welfare facilities, their location on site and regular maintenance during the planning and preparation stage of any project, whether or not CDM applies.
- Arrange for equipment to be available, provided, sited and connected to services before construction work (including demolition) starts or when additional numbers of workers start on site.
- Make sure the facilities reflect the site size, nature of the work, and numbers of people who will use them. If a large number of people are working on site or the work being carried out is particularly dirty or involves a health risk (e.g. pouring concrete), you will need more washing facilities (which may include showers), toilets, etc.

General welfare requirements

- Ensure that all toilet, washing, changing, personal storage and rest areas are accessible and have adequate heating, lighting and ventilation.
- Facilities may need to be provided at more than one location to make sure workers have easy access.
- Make sure someone is responsible for keeping the facilities clean and tidy. How often the facilities will need cleaning will depend on the number of people on site and on how quickly they become dirty. Basic daily cleaning may not always be enough.

Toilets

- Make sure that an adequate number of toilets are provided at all times.
- Men and women may use the same toilet, provided it is in a lockable room and partitioned from any urinals which may also have been provided. Otherwise separate toilets will be needed.
- Wherever possible connect toilets to a mains drainage system and ensure they are water flushing. If you cannot do this, use facilities with built in supply and drainage tanks.
- Where portable, no mains toilets (chemical) are used, make sure they are serviced regularly in accordance with the supplier's recommendations. The frequency of servicing will depend on the amount of use. Make sure the toilet is always accessible for servicing.
- Units used by female workers should have effective means for disposal of sanitary waste.
- Make sure adequate supplies of toilet paper are always available.

Washing facilities

- Put washing facilities next to both toilets **and** changing areas and make sure they include:
  - basin(s) or sink(s) large enough for people to wash their face, hands and forearms;
  - a supply of hot and cold or warm running water;
  - soap and towels (either cloth or paper) or dryers.
- If mains water is not available, use clean water supplied from a tank.
- You may need more washing facilities, including showers, where the work is particularly dirty or when workers are exposed to especially hazardous substances, e.g. development of contaminated land, or demolition of old industrial buildings which are contaminated with toxic substances, etc. These will need to be separate from the main facilities.
- You may need specialist facilities for certain activities, e.g. working with lead, asbestos, tunnelling under compressed air, etc.
- Men and women can share basins used for washing hands, face and arms.
- A shower may be used by both men and women so long as it is in a separate, lockable room which can be used by one person at a time.

Storing and changing clothing

- Every site should have arrangements for storing:
  - clothing not worn on site (e.g. jackets, training shoes, etc.);
  - protective clothing needed for site work (e.g. wellington boots, overalls, reflective jackets)
- Separate lockers might be needed, although on smaller sites the site office may be a suitable storage area, provided it is kept secure.
- Where there is a risk of protective site clothing contaminating everyday clothing, store items separately.
- Men and women should be able to change separately.
- Make sure that wet site clothing can be dried.
- Many fires have been caused by placing too much clothing to dry on electrical heaters, making the heater overheat. If electrical heaters are used, ensure they are properly ventilated and if possible, fitted with a high-temperature cut-out device.

Rest facilities

- Provide facilities for taking breaks and meal breaks. The facilities should provide shelter from the wind and rain and be heated as necessary.
- The rest facilities should have:
  - tables and chairs;
  - a kettle or urn for boiling water
  - a means for warming up food (for example, a gas or electrical heating ring, or microwave oven).
- Non-smokers should be able to use the facilities without suffering discomfort from tobacco smoke. Provide ventilation, or if this is not possible, you may need to provide separate areas for smokers and non-smokers, or ban smoking in the presence of non-smokers.
- On small sites, the site office or hut can make a suitable rest area, especially if it is one of the common portable units.
- Do not store plant, equipment or materials in rest areas.

Drinking water

- Make sure that there is a supply of wholesome drinking water readily available. Whenever possible, it should be supplied direct from the mains. Otherwise use bottles or tanks of water.
- If water is stored, protect it from possible contamination and make sure it is changed often enough to prevent it from becoming stale or contaminated.
- Clearly mark the drinking water supply to prevent it being confused with water which is not fit to drink or hazardous liquids.
- Provide cups or other drinking vessels at the water tap, unless the water is supplied in an upward jet which can be drunk easily (for example, a drinking fountain).

Heating

- Inadequately ventilated LPG cookers and heaters can produce carbon monoxide. Gas may escape from leaking cylinders which have not been properly turned off. You can eliminate these risks by using properly maintained electrical equipment instead. If this is not possible, reduce the risk by:
  - Using and storing the cylinders in safe, well ventilated places outside the accommodation (including overnight).
  - Providing adequate combustion ventilation (provide fixed grills at high and low level).
  - Checking that cylinders are properly turned off when not in use. Turn off the tap at the appliance and isolate the cylinder.
  - Using wall or ceiling mounted carbon monoxide detectors.

Source: HSE (1996)

4.6 Industrial hygiene

An effective occupational health programme is essential for organisations working in the construction industry. Industrial hygiene together with occupational medicine programmes are important elements of the occupational health programme.

The industry's commitment to provide and maintain a healthy working environment is the foundation for basic requirements upon which each individual organisation can build their own industrial hygiene programmes directed at their specific needs.

It is line management's responsibility to maintain a healthy working environment. Industrial hygiene specialists are available to assist line management in maintaining that healthy work environment. An example of some industrial hygiene practices is given in Example 4.6.1

4.6.1 Basic requirements for an industrial hygiene programme

For each construction site an industrial hygiene programme should be established for the detection, surveillance and control of hazards which can potentially affect the health of the organisation's employees and that of members of the public. The programme should include the following specific elements and systems.

General

- A person shall be assigned to coordinate the programme.
- Assess the health and environmental information provided, if the information is related to intended uses of unknown products.
- Provide a written description of the programme including a means of implementation.
- The industrial hygienist will actively participate in hazard communication programmes.
- The industrial hygienist will maintain ongoing communication programmes.
- The industrial hygienist will maintain ongoing communications with occupational medics and other functions (e.g. safety, toxicology, epidemiology and environmental services) to assess the effectiveness of the programmes.

Identification

- Workplaces and construction sites should be surveyed to identify exposures to chemical, biological and physical agents with potential health significance in the workplace. Training, monitoring and control activities shall be organised.
- A mechanism should be established to review the industrial hygiene considerations of the design or modifications.

Exposure valuation

- A written plan should be established for conducting periodic reviews to evaluate potential sources of exposures, the effectiveness of control methods and to set priorities for in-depth exposure monitoring.
- Industrial hygiene monitoring surveys should be performed in accordance with local regulations.

Exposure control

- A mechanism should be established for selecting and applying appropriate corrective measures where the results of monitoring, new information or other observations indicate a need to reduce the potential exposure during normal operations as well as emergencies.
- Engineering control should be emphasised, but consideration must also be given to administrative and work practice controls and to the provision and use of PPE.

Communication and training

- Communication and training programmes shall be provided for employees potentially exposed to chemical, physical or biological agents. These programmes should include contractors and subcontractors as appropriate.
- Employees should be informed of the following.
  - The potential health effects of chemical, biological and physical agents.
  - Location of health and safety information sheets (MSDS).
  - Methods to detect and control exposures.
  - Levels of exposures and employees' responsibilities to follow established safe work practices.

Data management

- Procedures should be established for the timely documentation and communication findings from industrial hygiene surveys.
- Data management systems should be used to organise, store and retrieve industrial hygiene chemical inventories, exposure data, work history data and training records.

Regulatory compliance

- Knowledge of applicable regulations is required.

Example 4.6.1
Examples of industrial hygiene general practices

Exposure of fire investigators at the scene of a fire

Only limited information is available on the exposure of firefighters during fire investigations, when self-contained supplied air respirators are typically not worn. Area air and personal breathing zone samples were collected and analysed for hydrogen cyanide, inorganic acids, aldehydes, elemental carbons, total and respirable dust, volatile organic compounds, metals and polynuclear aromatic hydrocarbons. In addition, a portable dust monitor was used to obtain real-time dust measurement and particle size distribution. Results indicate that dust generated during these activities can be respirable and inhalable, and that appropriate respiratory protection, such as air-purifying respirators should be used.

Reducing benzene and styrene exposures

Benzene and styrene exposures at a plant are normally low due to fully enclosed processes. Over-exposure can occur when reactors, vessel pumps, and other process equipment are opened for repairs. Company health and safety personnel used a proactive approach for a 6 week turnaround. Industrial hygienists attended the pre-turnaround planning meetings and addressed management of special industrial hygiene concerns and requirements. Benzene and styrene hazard training was attended by hundreds of contract workers. Prior to opening the equipment, a non-toxic by-product was circulated throughout the equipment to absorb benzene and styrene before the usual steps of steam purging, hot water washing and air flushing.

Evaluation of vibration in heavy construction equipment

Past studies have shown that musculoskeletal diseases affect operators of heavy construction equipment. Some risk factors include whole body vibration (WBV), awkward postural requirements, and psychosocial factors. Although several studies have illustrated an association between operating heavy construction equipment and manifestation of musculoskeletal diseases, only a few studies have quantitatively evaluated the exposures. It is believed that reducing the exposure to WBV may be an important factor in determining the health, comfort, and efficiency of these operators. High levels of acceleration in the lower frequencies can be deleterious to the lower back.

Source: American Industrial Hygiene Association (website: http:/www.aiha.org)

4.7 Training and information

4.7.1 Training

Training is the development of attitude, knowledge and skill patterns required by a person to perform adequately a given task or job.

The need for appropriate training is enshrined in most national legislation on health and safety.

In its broadest sense, training is far more than attendance on training courses. However, managers should beware of the approach that suggests that all necessary training can be done 'on the job' by following the example of more experienced personnel. This can lead to the development of entrenched views, especially in the health and safety field — 'I've been doing it this way for thirty years and it never did me any harm!' is not an acceptable reason for action.

To ensure that training is appropriate and effective, reviews should be held as frequently as possible and at least at the following key change points:

- At the commencement of employment
- When transferred to a different location (e.g. a new site)
- When an individual's responsibility alters
- When new work equipment or technology is introduced
- Whenever new systems or processes are introduced.

Although this manual does not cover all the aspects of training, practical guidance is given in the various sections. Sample workplace 'toolbox talks' are provided.

Considerate employers will ensure that health and safety issues are covered adequately as part of a coordinated, systematic training programme for each employee.

The endemic lack of control over all aspects of the construction workforce creates particular problems for trainers. Various forms of certification of safety training have been developed in several European states, particularly in the engineering construction sector. For example, the VVA/VCA system in the Netherlands has so far been adapted for use in Belgium, France and Germany. This system covers the certification on

management systems which includes worker/supervisor/manager safety training. In the UK the CCNSG (Client and Contractors National Safety Group) operates a safety training passport scheme covering a number of large petrochemical conurbations.

4.7.2 Questionnaires

Questionnaires are a quantitative method for obtaining information about a research topic. There are many useful texts regarding questionnaire design, which should be studied, prior to undertaking this approach (e.g. Fellows and Liu 1997, Moser and Kariton 1992). Questionnaires have been used to good effect to obtain information on occupational health and also raise awareness of health issues. Sample questionnaires are given in Examples 4.7.1. to 4.7.4

Example 4.7.1
Audiometric Questionaire

AUDIOMETRIC QUESTIONNAIRE

This questionnaire could be useful in the assessment of noise-associated risk factors.

Noise exposure

1. Do you have to shout at someone who is working beside you (0.5 m or one arm's length away) in order to be heard? Yes/No
2. Do you use noisy tools or machinery at work? Yes/No
   (If no, go to question 5)
3. If yes, do you use them ..... Usually/Occasionally
4. For what jobs, for how long, and did you wear hearing protection?
   Job .....
   Years/Months .....
   Hearing Protection used .....
5. Have you had previous jobs that were noisy? Yes/No
   (If no, go to question 7)
6. For what jobs, for how long, and did you wear hearing protection?
   Job .....
   Years/Months .....
   Hearing Protection used .....

Acoustic trauma

7. Have you been exposed to guns or firearms? Yes/No
   (If no, go to question 11)
8. Under what conditions (e.g. Territorial Army, Regular Army, gun clubs)
   .....
9. Have you been caught unaware/unprotected in an explosion? Yes/No
10. Where? .....

Medical conditions

11. Do you suffer from painful or discharging ears? Yes/No
12. Do you have a close relative who became deaf when young (under 30)? Yes/No

Hobbies and pastimes

13. Do you have a hobby, which may be noisy for which some people wear hearing protection? Yes/No
    Which hobby? .....
14. Do you wear hearing protection? Yes/No
15. Do you use a personal hi-fi system? Yes/No

Source: McBride 1993

Example 4.7.2
Noise problem identification

IDENTIFICATION OF NOISE PROBLEMS — QUESTIONNAIRE

The HSE recommend consideration of the following points. If the answer to any of the following questions is 'yes' there may be a need for a noise control programme.

1. Do workers find it difficult to hear each other when they speak in the noisy work environment?
2. Have workers complained of head noises or ringing in the ears after working in the noise for several hours?
3. Have workers who have been exposed to high noise levels for short periods experienced temporary deafness, severe enough for them to seek medical advice?
4. Have workers exposed for longer periods complained of a loss of hearing that has had the effect of muffling speech and other sounds?
5. Have their families told them that they are becoming deaf?
6. Has there been a higher labour turnover in tasks with a lot of noise?
7 Is there the opinion that noise is affecting production?

Source: HSE

Example 4.7.3
Health interest survey

SURVEY OF EMPLOYEE INTEREST IN HEALTH

A survey of employee interest in work wellness and occupational health could be undertaken at the start of a project both to raise awareness of health and to help direct health management. These questionnaires could be completed anonymously.

Examples of questions are listed below.

1. Are you interested in participating in a workplace wellness programme? Yes/No

2. If 'no' why not? .....
.....

3. In your opinion, which of the items listed below would be important for you as part of such a programme?

Physical fitness activities	First aid
Nutrition information	Health awareness at work
Weight management	Back care programme
Specific health education, e.g. noise-induced hearing loss, skin protection	Fitness testing
Blood pressure screening	Health appraisals
Cholesterol screening	Giving up smoking
Alcohol/drug use education	Stress management
	Relaxation techniques

4. Would you be willing to assist in developing and leading an activity? Yes/No

5. Do you have any other ideas for the programme regarding the management of your health at work? Yes/No

.....
.....

Source: Grant and Brisbin (1992)

Example 4.7.4
Respiratory problems surveillance

HEALTH SURVEILLANCE QUESTIONNAIRE FOR WORKERS AT-RISK FROM RESPIRATORY PROBLEMS

The UK's HSE has provided a suggested format for the development of a questionnaire to be used by a responsible person as part of health surveillance. Readers should refer to the original document prior to implementing such a questionnaire.

Sample questions taken from this document are listed below.

Initial questionnaire

1. Personal details .....
2. Have you any chest problems, such as periods of breathlessness, wheeze, chest tightness or persistent coughing? Yes/No
3. Do you believe that your chest has suffered as a result of any previous employment? Yes/No
4. Do you or have you ever had any of the following?
   (Do not include isolated colds, sore throats or flu)
   - Recurring soreness of or watering of eyes Yes/No
   - Recurring blocked or running nose Yes/No
   - Bouts of coughing Yes/No
   - Chest tightness Yes/No
   - Wheezing Yes/No
   - Breathlessness Yes/No
   - Any other persistent or history of chest problems Yes/No

Ongoing surveillance

To be completed 6 weeks, 6 months and annually after employment commences

1. Since starting your present job have you had any of the following symptoms either at work of at home?
   (Do not include isolated colds, sore throats or flu)
   - Recurring soreness of or watering of eyes Yes/No
   - Recurring blocked or running nose Yes/No
   - Bouts of coughing Yes/No
   - Chest tightness Yes/No
   - Wheezing Yes/No
   - Breathlessness Yes/No
   - Have you consulted your doctor about chest problems since the last questionnaire? Yes/No

Source: HSE 1994 Preventing Asthma at Work

4.8 Personal Protective Equipment (PPE)

It is well known that an employer's first priority must be to change the employee's task conditions. The issue of personal protective equipment (PPE) must be one of the last actions to protect an employee from a potential hazard. Proactive actions such as elimination, substitution or designing-out potential hazards are more in line with modern proactive personal protection than the automatic issue of PPE.

When being issued, PPE must be subject to a risk assessment by individual contractors for specific tasks to ensure suitability. To use the same generic assessments continually for different locations and different conditions is not a recommended route to take.

Most countries have their own regulations. For example, in the UK PPE must also comply with CE marking standards in accordance with the Personal Protective Equipment at Work Regulations. These regulations are derived from the European Directive 89/391/EEC Article 16(1).

PPE is often issued in response to accident hazards (rather than health hazards), however the following are examples of PPE in response to health hazards.

- Masks and breathing apparatus
- Ear defenders
- Body suits
- Knee pads
- Warm clothing
- Waterproofs
- Thermal suits
- Respiratory protection
- Noise protection
- For asbestos-related work
- For screeding/floor tiling, etc.
- For work in cold weather
- For work in wet weather
- For hot and/or cold work

In some instances PPE is issued in response to potential health risks to others, such as protective hats/hair nets/beard guards, for work in food plants, etc.

4.9 Record keeping/data

4.9.1 Why must records be kept?

Recent EU legislation, which has resulted in Member State regulations such as CDM in the UK, has become less prescriptive than was previously the case. As a result there is little specific legislative guidance on record keeping in most cases. Each organisation must

decide what records to keep based on company policy and past experience. Exceptions to this include such areas as hazardous materials and ionising radiation where specific regulations derived from EC Directives regarding record keeping apply in most EU Member States.

Record keeping costs money, but should result in cost savings in the long run, through better informed strategic planning for occupational health and reduced compensation claims. Further benefits such as higher productivity, improved morale, greater control of hazards and confidence from insurers, should accrue but are difficult to quantify in the short, medium and even long term.

Reasons for keeping long term records:

- To comply with specific regulations where they apply.
- To enable a company to defend claims for compensation for alleged injury to health.
- To aid epidemiological research and identify patterns of illness.

A record keeping strategy is given in Example 4.9.1. The legal requirements that apply in the UK are summarised in Example 4.9.2 (Croner 1998b)

Of course, under the EU Temporary and Mobile Construction Sites Directive (UK CDM Regulations) certain records need to be kept as part of the Health and Safety File. However, they generally do not impact on occupational health during the construction phases and are not covered in detail here. For a full coverage of the requirements of the Health and Safety Plan and File see ECI's *Total Project Management of Construction Safety, Health and Environment* (ECI 1995)

4.9.2 Confidentiality

The view of the British Medical Association (BMA) is that 'the personal medical records of workers maintained by a doctor for professional use are the doctor's own confidential documents, and that access to them must not be allowed to any other person without his or her consent and that of the worker concerned or by order of a competent court or tribunal directed to the doctor. The arrangements for records should be clearly defined in the occupational physician's contract of employment. The occupational physician is solely responsible for the safe custody of the medical records.'

The rules on confidentiality also apply to the nurse and any clerical support staff who may see the clinical records.

4.9.3 Storage media

Whichever system is adopted, it is important that all the relevant facts can be retrieved when required. Ideally there should be at least two copies of records, stored remote from each other. There are three main types of storage media, paper, computer-based and photographic records.

Paper

Most records start on paper and so the storage of paper automatically takes place. The disadvantage is that paper is heavy and bulky and so, ultimately becomes expensive to store.

Computer-based

Despite the promises of a paperless society driven by advances in information technology (IT), it is still some way off in the area of record keeping. However, the greatest advantage of a computer database is the ease at which data can be manipulated for example searches, comparisons, etc. These features are useful for epidemiological studies but less so for archival purposes. Disadvantages of computer storage of archival records include the following.

- Computers crash!
- Computer systems date quickly making it difficult to access data.
- Dedicated 'old' machines and software may need to be kept and maintained.
- Magnetic images decay with time such that the files need to be copied every few years.
- The magnetic medium is sensitive and is easily damaged.

Photographic

Copying records on to film or fiche is a well established practice. Storage life is usually in excess of 50 years.

Example 4.9.1
Some examples of records relevant to health management

Records	Responsibility	Format	Special requirements
Health assessment	Medical advisor	Paper/film	Regulations apply
Hazardous material assessments	Chief chemist	Paper/film	None
Health surveillance results	Occupational health nurse	Paper/film	None
Audiometry	Occupational health nurse	Paper	None
Noise measurements	Safety department	Paper	None
Health training records	Training department	Computer	Refreshers, course synopsis
Employment details	Personnel department	Paper	None
Risk assessments, e.g. manual handling	Departmental manager	Paper	None
Statutory PPE inspections	Safety department	Computer	Backup needed
Employers liability claims	Safety department	Paper	None

Source: Adapted from data of Alstom Automotive

Example 4.9.2
UK legislative requirements for record keeping

UK Legislation where there is record keeping time stipulation		
Act or Regulation	**Record**	**Period record must be kept**
COSHH		
Reg 7(10)	List of employees exposed to group 3 and 4 biological agents	10 years after last exposure
Schedule 9	Where exposure may lead to a disease many years later	40 years after last exposure
Reg 9	Examination and testing of control equipment and repairs carried out as a result	5 years
Reg 10	Exposure at the workplace	
	(i) General exposure	5 years
	(ii) Personal exposure of identifiable employee	40 years
Reg 11	Health Surveillance	40 years from date of last entry
Factories Act General Register Order 1973	General Register	2 years after date of last entry
RIDDOR 1995	Reportable injuries diseases and dangerous occurrences	3 years
Social Security (Claims & Payments) Regulations 1979	Accident Book (Form BI 510)	3 years from date of last entry
The Ionising Radiations Regulations 1985	(i) Health Records	50 years from date of last entry
	(ii) Examination of Respiratory Protective Equipment	2 years
The Ionising Radiations (Outside Workers) Regulations 1993	Radiation Passbook	5 years after finish of use
Control of Lead at Work Regulations 1998		
Reg 8(4)	Maintenance of Control Measures	5 years from date at which entry was made
Reg 9(5)	Air Monitoring	5 years
Reg 10(3)	Medical Surveillance	40 years from date at which entry was made
Control of Asbestos at Work Regulations 1987	Health Surveillance	30 years after last record
Work in Compressed Air Regulations 1996	(i) Health Surveillance	40 years from date of last entry
	(ii) Exposure	40 years from date of last entry
Special Waste Regulations 1996	Consignment Note	3 years
Environmental Protection (Duty of Care) Regulations 1991	Consignment Note (Controlled Waste)	2 years

Source: Croner (1998b)

5. European Union health legislation and health agencies

5.1 European Union legislation

Following the Treaty of Rome, the EU was empowered to enact legislation for the Member States. That legislation generally takes the form of either a Directive or a Regulation and will begin life as a proposal for a new law from the European Commission. That proposal will then be sent to the European Parliament for consultation and comment. Once it has been accepted by the Parliament, the proposal is then subject to further comment by the Commission, who will eventually send it to the Council of Ministers for adoption.

Once adopted, Directives must be implemented by every Member State through local law. Regulations, on the other hand, have direct effect and therefore automatically become part of local law. Of these two, Directives are by far the most common source of European health and safety legislation.

Generally Member States are permitted a great deal of discretion when implementing a Directive. Having said that, if a Member State fails to adequately implement a Directive it can be brought before the European Court of Justice on charges that it has infringed its duties.

In the past 10 years the EU has focused its attention on a number of health issues, which has led to a number of health-related Directives. The most important of these is the 'Framework' Directive (89/391/EEC), which aims to ensure convergence and harmonisation of health and safety legislation across Member States, by covering all sectors of activity, public and private (except the self-employed and domestic servants).

Under the Framework Directive employers must:

- Ensure the health and safety of workers in every aspect related to work.
- Develop an overall health and safety policy.
- Assess risks, update assessments with changing circumstances, and take preventative measures.

- Record risks and accidents.
- Inform workers and/or their representatives of risks and preventative measures taken.
- Consult workers and/or their representatives on all health and safety matters.
- Provide job-specific health and safety training.
- Designate workers to carry out activities related to the prevention of occupational risks.
- Carry out appropriate health surveillance of workers.

Five daughter Directives were adopted to supplement the Framework Directive. Those Directives focus on the health effects of the workplace, work equipment (e.g. VDUs) and working methods and operations (e.g. manual handling). EU Member State implementation is covered in Appendices 3 – 17.

At the time of writing a number of additional health Directives are being considered in the EU including:

- Directive on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents.
- Directive on the protection of the health and safety of employees and others from the risks related to chemical agents at work *(this has now been adopted).*
- Directive to amend Directive 90/394/EEC on the protection of workers from the risks related to exposure to carcinogens at work.

If passed, these Directives will have to be implemented by local law in the various Member States.

5.2 European health agencies and organisations

Some of the more important health agencies and organisations working in the EU are now listed. These agencies provide advice, assistance and information on a wide variety of health issues. Agencies working in individual European Member States are listed in Appendices 3 – 17.

5.2.1 The European Construction Institute

The European Construction Institute (ECI) was established in 1990 and is an independent non-profit making organisation funded by its members. It represents many leading European and multi-national companies. ECI's mission statement is as follows.

To bring together Clients, Contractors and Consultants to achieve continuous improvement in the efficiency, excellence and international competitiveness of European construction through research, development, cooperation and implementation.

Members receive a number of benefits including:

- Access to best practice material from Europe and the USA.
- Participation in leading edge improvement task forces, e.g. health, safety and construction environment, benchmarking, productivity and total quality in construction.
- Networking with like-minded organisations.
- Future insights and information via newsletters, conferences, seminars and workshops.

Further information can be obtained from:

ECI, Arnold Hall Building, Loughborough University
Loughborough, Leicestershire, LE11 3TU
Tel: +44(0) 1509 222620
Fax: +44(0) 1509 260118
e-mail: ECI@lboro.ac.uk
Website http://www.lboro.ac.uk/departments/cv/eci

5.2.2 The European Agency for Safety and Health at Work

The founding Regulation for the agency is as follows:

In order to encourage improvements in the working environment, the Agency shall provide 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.

Furthermore, the Regulation states the areas in which the Agency shall play a role:

- Collect and disseminate technical, scientific and economic information in the Member States in order to pass it on to the Community bodies, Member States and interested parties.
- Collect and disseminate information on research.

- Promote and support cooperation and information exchange among the Member States.
- Establish an information network in cooperation with Member States.
- Provide information on methods and tools for prevention activities.
- Contribute to the development of future Community programmes.

For further information contact:

European Agency for Health and Safety at Work
33 GranVia, 48009 Bilbao, Spain
Tel: +34 4 4794360
Fax: +34 4 4794383

5.2.3 The International Social Security Association (ISSA)

The ISSA is a world organisation of agencies responsible for social security systems. The ISSA has more than 300 members in over 120 countries all over the world. The headquarters are within the International Labour Office in Geneva. The ISSA has three main fields of activity:

- Research and documentation activities
- Regional activities
- Technical activities in the area of social security.

Within the framework of technical activities, ten permanent committees and a study group deal with different aspects of social security and investigate sector-specific problems — for instance, in relation to sickness, old age, invalidity or unemployment. The permanent committee on insurance against employment accidents and occupational diseases and the permanent committee on prevention of occupational risks with its eleven international sections on prevention of occupational risks are of special importance for safety.

One of the sections is the ISSA International Section for the construction industry. Others cover the mining, chemical, iron and metalwork, electricity, agriculture and machinery guarding industry sectors. The extremely high accident risks in the construction industry call for a safety strategy that can deal with the continuous changes of the working environment on construction sites. The aim is not only to solve individual problems, but also to increase safety and accident prevention in construction industry operations overall, especially by intensified cooperation between the various trades working on the same site.

For further information contact the secretariat of the French Section:

Organisme Professional de Prévention du Bâtimént et des Travaux Publics (OPPBTP), Tour Amboise
204, Rond-Point du Pont-de-Sèvres
F-925 16 Boulogne-Billancourt
France
Tel: +33(1)46092654
Fax: +33(1)46092740

ISSA can be contacted at:

ISSA, P.O. Box 1,
CH-121 1, Geneva 22
Switzerland

5.2.4 The European Foundation for the Improvement of Living and Working Conditions

A key role of the European Foundation for the Improvement of Living and Working Conditions is the promotion of health and safety. The Foundation has a keen interest in preventive strategies and worker involvement. Rather than an exclusive focus on safety, it supports health and well being, health behaviours and health-conducive work environments.

For further information write to:

European Foundation for the Improvement of Living
and Working Conditions
Loughlinstown House, Shankhill, Co. Dublin
Ireland
Tel: +353 1 204 31 52
Fax: +353 1 282 64 56

5.2.5 Euro Research Network

The Euro Research Network for Exchange of Information on Health and Safety Research comprises correspondents from institutes in the European Union, the European Commission, the ILO, Norway and the USA. The correspondents discuss topical issues, exchange views and provide the most recent findings through national experts. Details of national experts are given in the appropriate state Appendices (3–17).

The Network is coordinated by the European Foundation for the Improvement of Living and Working Conditions (See § 5.2.4).

References

Anon (1997a). Widow of asbestos victim wins substantial damages. *Safety and Health Practitioner* May, 5.

Anon (1998a). Workstation and job design failures cost employer. *Health & Safety Bulletin* January, **265**, 3.

Anon (1998b). British Coal loses landmark compensation case. *Health & Safety Bulletin* April, **268**, 22–23. (The full High Court judgement from 23/1/98 can be down-loaded at http://www.open.gov.uk/courts/court/qbdind.htm)

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Beck, M. H. (1990). Letter to editor. *British Medical Journal* **301**, 932.

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Confederation of British Industry (CBI) in Don, P. (1997). Workplace Ill-Health, Safety Management, British Safety Council, May, ISSN 0951 2624, p. 1.

Croner (1995). *Management of Construction Safety — Amendment Service.* Croner Publications Ltd, Surrey.

Croner (1998a). *TUC Urges Asbestos Switch.* Construction Safety Briefing, Croner Publications Ltd, Surrey, Issue 35, August, p. 3.

Croner (1998b). *Records — How Long Should They be Kept?* Construction Safety Briefing, Croner Publications Ltd, Surrey, Issue 35, August, pp. 6–7.

Deacon, S. (1995). *Health Surveillance at Work, The Health & Safety Series — Best Practice Management Reports*, (Series editor M. Taylor). Technical Communications (Publishing) Ltd. Hitchen, Herts, ISBN 1-85953-001-1.

E&P Forum (1993). *Health management guidelines for remote land-based geophysical operations.* Report No. 6.30/190 Words and Publications, Oxford.

European Commission (1995). *Labour Inspection (Health & Safety) in the European Union Senior Labour Inspectors Committee.* Copies available from: Unit 5 Accident/Injuries, The European Commission, The Plateau de Kirchberg, L-2920 Luxembourg.

European Commission (1996). *Guidance on Risk Assessment at Work*. Office for Official Publications of the European Communities, Luxembourg.

European Commission (1997). *Labour Inspection (Health & Safety) in the European Union — A Short Guide (Austria, Finland, Sweden)*. Senior Labour Inspectors Committee. Copies available from: Unit 5 Accident/Injuries, The European Commission, The Plateau de Kirchberg, L-2920 Luxembourg.

ECI (1995). *Total Project Management of Construction Safety, Health and Environment*. 2nd Edition, (Editors A.G.F. Gibb, D. Tubb and T. Thompson). Thomas Telford, London, ISBN 0-7277-2082-1, p. 206.

Fellows, R. and Lui, A. (1997). *Research Methods for Construction*. Blackwell Science, Oxford.

Grant, C.B. and Brisbin, R.E. (1992). *Workplace Wellness. The Key to Higher Productivity and Lower Health Costs*. Van Nostrand Reinhold, New York, pp. 117–118.

Gründemann, R.W.M. and van Vuuren, C.V. (1998). *Preventing Absenteeism at the Workplace: a European Portfolio of Case Studies*. European Foundation for the Improvement of Living & Working Conditions, Dublin, Ireland.

Gyi, D.E., Haslam, R.A. and Gibb, A.G.F. (1998). Case studies of occupational health management in the engineering construction industry, *Occupational Medicine* **48**, No. 4, 263–271.

Harrington, J.M. and Gill, F.S. (1992). *Occupational Health*. Blackwell Scientific Publications, Oxford.

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Moser, C.A. and Kalton, G. (1992). *Survey Methods in Social Investigation*, Gower Publishing Group, Aldershot.

PowerGen (1996). *The CDM Regulations — A Design Risk Assessment Manual* Blackwell Science, Oxford, ISBN 0 632 04087 4.

Pritchard, C. (1996). Where is the health in construction health and safety management? *Proceedings CIB W89 Beijing International Conference*, 21–24 October, China Architecture and Building Press, Beijing, ISBN 7 112 02264 9.

Rosen, R. H. and Freeman, S. (1992). Occupational contact dermatitis in New South Wales. *Australian Journal of Dermatology* 92/1, 1–10.

Appendix 1
Further information and training/educational aids

A1.1 General health issues

Croner (1995). *Management of Construction Safety — amendment service.* Croner Publications Ltd, Surrey.

A comprehensive loose-leaf document covering all aspects of construction safety. Health issues are covered but not in detail.

ECI (1995). *Total Project Management of Construction Safety, Health and Environment.* 2nd Edition, (Editors A.G.F. Gibb, D. Tubb and T. Thompson). Thomas Telford, London, ISBN 0-7277-2082-1, p. 206.

ECI's European guidance manual covering health, safety and environmental issues with practical advice for all stages of the construction process.

Fink, S. (1998). *Health and Safety Law for the Construction Industry*, Thomas Telford, London.

UK-based guidance on health and safety law, also covering European Legislation.

Gründemann, R.W.M. and van Vuuren, C.V. (1998). *Preventing Absenteeism at the Workplace: a European Portfolio of Case Studies.* European Foundation for the Improvement of Living & Working Conditions, Dublin, Ireland.

Gyi, D.E., Haslam, R.A. and Gibb, A.G.F. (1998). Case studies of occupational health management in the engineering construction industry, *Occupational Medicine* 48, No. 4, 263–271.

Journal paper presenting research findings of a pilot study of occupational health management in UK construction.

Harrington, J.M. and Gill, F.S. (1992). *Occupational Health.* Blackwell Scientific Publications, Oxford.

UK based occupational health text book — Good background information covering basic principles.

Health and Safety Executive (HSE)

HSE publications are updated on a regular basis by the UK's Health & Safety Executive. Various HSE documents are referred to in this appendix — this listing is not exhaustive. For a current list of HSE publications (including free leaflets) contact:

HSE Books, PO Box 1999, Sudbury, Suffolk, CO10 6FS
Tel: +44 (0)1787 881165
Fax: +44 (0)1787 313995 / 370769

Institut National de Recherche et de Sécurité (INRS)

SHE publications are updated on a regular basis by the INRS. For a current list of publications contact :

INRS, 30 rue Olivier Noyer
F-75680 Paris, France
Tel: +33 (0) 1 4044 3000
Fax: +33 (0)1 4044 3041
Website: http://www.inrs.fr

Organisme Professionnel de Prevention du Bâtiment et des Travaux Publics (OPPBTP)

SHE publications are updated on a regular basis by OPPBTP. For a current list of publications contact:

OPPBTPP, Rour Amboise
204, rond-point du Pont de Sévres
92516 Boulogne Billancourt Cedex, France

Tel: +33 (0) 1 46092691
Fax: +33 (0) 1 46092740
Website: http://www.oppbtp.fr

A1.2 Specific health or ill-health issues

HSE (1994). *Manual Handling — Solutions You Can Handle.* ISBN 0 7176 0693 7.
Croner, Manual Handling Operations, Croner House, London Road, Kingston upon Thames, Surrey, KT2 6BR.
A practical document giving advice on manual handling — not specifically construction.

HSE (1990). *Work-Related Upper Limb Disorders: a Guide to Prevention* ISBN 0 7176 0475.

HSE (1994). *Hand–Arm Vibration* ISBN 0 7176 0743 7.

HSE (1997). *Vibration Solutions: Practical Ways to Reduce the Risk of Hand–Arm Vibration Injury* ISBN 0 7176 0954 5.

HSE (1994). Preventing Asthma at Work: How to Control Respiratory Sensitisers ISBN 0 7176 0661 9.

The European Diving Technology Committee
c/o Stolt Cornex Seaway
Bucksburn House, Hawes Road
Aberdeen, AB21 9RQ, UK

International Marine Contractors Association (IMCA)
Carlyle House, 235 Vauxhall Bridge Road
London, UK
Tel: +44 171 9318171
e-mail: imca@imca-int.com

BAPS Health Publications Unit. *Drugs, A Parents Guide, The Signs, The Dangers, What to do.*
DSS Distribution Centre, Heywood Stores,
Manchester Road, Heywood,
Lancashire O10 2PZ
Tel: (within the UK) 0800 555 777.
A short leaflet aimed at parents but provides useful background information that would be useful for managers.

Department of Health. *Drug & Solvent Misuse, A Basic Briefing.*
A guide for professionals, parents and others who need to know more about drugs and their effects. Available from the UK's Department of Health.

The HSE leaflet *Drug Misuse at Work* is published on the Internet at Website: http://www.open.gov.uk/hse/pubns/indg91.htm

A1.3 Control measures and influencing factors

European Commission (1996). *Guidance on Risk Assessment at Work.* Office for Official Publications of the European Communities, Luxembourg.
The EC's official guidance document covering all aspects of risk assessment.

HSE (1995) *Health Risk Management.* HSE Books, Suffolk ISBN 07176 09057.
A guide produced by the UK's HSE especially for managers in small and medium sized firms.

HSE, *5 Steps to Risk Assessment*
A short leaflet with practical advice, especially for small firms, but mainly directed at the commercial, service and light engineering sectors.

PowerGen (1996). *The CDM Regulations — A Design Risk Assessment Manual* Blackwell Science, Oxford, ISBN 0 632 04087 4.
A detailed workbook, produced in collaboration with the European Construction Institute, providing a thorough method of design risk assessment.

Pheasant, S.T. (1991). *Ergonomics, Work and Health.* Macmillan Academic and Professional Ltd, London.
One of the better texts on ergonomics and human factors, with particular reference to occupational health matters.

E&P Forum (1993). *Health management guidelines for remote land-based geophysical operations.* Report No. 6.30/190 Words and Publications, Oxford.
A detailed guidance document covering on-shore oil and gas exploration activities.

HSE (1996). *Provision of Welfare Facilities at Fixed Construction Sites* (C500).

Royal Society of Health Diploma in Construction Health and Safety Management, RSH House, 38A St Georges Drive, London SW1 4BH.
UK diploma course in health and safety (more emphasis on safety). Various training centres.

Croner Training, Croner House, London Road, Kingston upon Thames, Surrey KT2 6BR.
UK based training organisation offering a full range of health and safety courses across various industry sectors.

HSE (1998). *The Selection, Use and Maintenance of Respiratory Protective Equipment: A Practical Guide.* HSE Books, Suffolk.

A1.4 European Issues

European Commission (1995). *Labour Inspection (Health & Safety) in the European Union Senior Labour Inspectors Committee.* Copies available from: Unit 5 Accident/Injuries, The European Commission, The Plateau de Kirchberg, L-2920 Luxembourg.

This is a document providing brief information on the organisation of health safety in Member States.

Appendix 2
Further information – internet sites

Agence Européenne Pour la Santé et la Sécurité au Travail
http://www.eu-osha.es

American Industrial Hygiene Association
http://www.aiha.org

Construction Occupational Health Project (COHP). A US site, which researches into Occupational Health. It has some useful publications.
http://www.uml.edu/Dept.WE/COHP/

Concaw (Oil companies' European organisation for environment, health & safety)
http://www.concawe.be

Croner Training. UK-based health and safety training and publications organisation.
http://www.croner.co.uk

epsc (European Process Safety Centre)
http://www.epsc.org

European Construction Institute (UK/Pan Europe)
e-mail: ECI@lboro.ac.uk
http://www.lboro.ac.uk/departments/cv/eci

GPO (United States Government Printing Office)
http://www.gpo.gov

Health and Safety Executive (UK)
http://www. open.gov.uk/hse/hsehome.htm
Full text versions of some of the free HSE publications featured on the HSE Website.

INRS (Institut National de Recherche et de Sécurité pour la prévention des accidents du travail et des maladies professionnelles)
http://www.inrs.fr

NIOSH (United States National Institute for Occupational Safety and Health)
Safety & health at work through research and prevention; a list of construction related Websites.
http://www.cdc.gov/niosh/constr.html

OSHA (US Department of Labour Occupational Safety & Health Administration
http://www.osha.gov
Additional links include:
gpo Free electronic access to information products of US Government including health topics.
cdc Information on a number of health-related subjects.

Organisme Professionnel de Prevention du Batiment et des Travaux Publics (OPPBTP)
http://www.oppbtp.fr

The World Health Organisation (WHO) has a comprehensive Website, including publications on a range of health related topics.
http://www.who.org

University of Oxford, Physical and Theoretical Chemistry Laboratory (Links to Material Safety Data Sheets)
http://www.physchem.ox.ac.uk

Appendix 3
Regulation of health issues in Austria

This appendix was compiled from information provided by Gerhard Elsigan of PPM, Austria, with additional information from the European Commission Document Labour Inspection (Health & Safety) in the European Union — A Short Guide (EC 1997).

A3.1 Responsibilities of the Labour Inspectorate

The Federal Ministry of Labour and Social Affairs in Austria has six departments, one of which is the Central Labour Inspectorate. Figure A3.1 shows the organisation of the field force responsible for health and safety.

The Austrian labour inspection system is governed by the Labour Protection Act of 1993 which sets out the duties and powers of labour inspectors and the organisation and procedures relating to the inspection of working conditions. The Labour Inspectorate has the responsibility to enforce the relevant health and safety legislation in the majority of workplaces in Austria including factories, construction sites, shops and offices and health services and private educational establishments. The Health and Safety Act of 1994, which has recently come into force, sets out the obligations placed on employers and employees and implements the Framework Directive and the more general requirements of the other principal directives concerned with health and safety adopted in the European Community. More detailed provisions are included in Codes of Regulations containing requirements for technical protection. Technical protection embraces safety, occupational health and hygiene matters and also the obligation on employers to provide information and training to their employees in connection with their health and safety. There are also Regulations dealing with working conditions which are concerned with hours of work and the protection both of pregnant women and young persons at work. The Labour Inspectorate has power to act only in cases where there is evidence of employment and consequently it has no authority to control the activities of the self-employed.

A3.2 Workers protection law 1994 (ArbeitnehmerInnenschutzgesetz 1994)

The legal basis for health and safety in the workplace is the 1994 Workers' Protection Law (ArbeitnehmerInnenschutzgesetz 1994). It replaces older legislation and includes changes in national legislation that were required to reach conformity with EU regulations. The law and some additional ordinances are in force, although some parts of it are still waiting to be transformed into more precise regulations through the instrument of ordinances. During the process of joining the European Union, Austria has modified its workplace health and safety regulations substantially. Naturally those changes also affect the construction sector.

The following is an outline of the major topics covered by the law, highlighting the major changes since 1994.

Access to prevention specialists for all workers regardless of the size of the company or construction site, and regardless of the legal form of the employing organisation

Pre-1994 legislation required private companies (not the public bodies) with more than 250 workers to provide occupational medicine and safety, smaller units were left out. Now the 1994 Workers' Protection Law (ArbeitnehmerInnenschutzgesetz 1994) stipulates that step by step smaller units shall be included (i.e. since 1 January 1998: companies or work sites between 50 and 99 workers). By the year 2000 all workplaces will be covered. It is obvious that health and safety in construction will be affected greatly, given the fact that many construction sites in Austria at any given moment have less than 50 workers of one single company present (but rather crews of different companies working on different parts of one construction project). The law also regulates the extent to which those services must be provided, by fixing a ratio between number of workers and minimum hours of prevention services. Leasing personnel are to be counted like a company's own workers. Regarding PPE the responsibility to equip leasing workers lies with the leasing company. However, many contracts stipulate that the company for whom the leasing worker is working can equip him/her with protective equipment, and charge the cost to the leasing firm.

A clearly interventionist type of professional OHS service

Occupational health and safety professionals are meant to and required to intervene in workplace design, organisation of work processes, as well as into unhealthy and unsafe behaviour. Their aim is to create a working environment and organisation and to develop behaviour that presents no danger to the health and safety of the workers. Health surveillance plays a role in the work of occupational physicians, but both the medical and the technical professionals in the preventive services should first look at how the working environment, working processes, and behaviour could contribute to avoid danger to workers.

Workplace risk assessment required for all workplaces and jobs

Risk assessment now has to be carried out and documented by the employer, and the workers should be involved in that process. This is more or less the reverse of the previous situation, where companies were supposed to follow the rules, but where it was the labour inspectorate's role to assess risks and intervene accordingly.

Establishment of true safety representatives

Although safety representatives were in place long ago, the 1994 law provides for a completely new position. Unlike before, when safety representatives were nominated by the employer, they can now be elected by the workforce.

Responsibility for coordination of safety matters on construction sites

Coordination is required, if the activities of another company may create a risk to a company's own personnel. This applies on construction sites, as normally workers of different companies are working on one site, constantly changing the shape and character of the place. Usually the coordination function lies with the main contractor. A new law regulating coordination on work sites has been under discussion for some time, but is not likely to pass parliament in the near future.

A3.3 Prevention specialists — their role and training requirements

The 1994 law created a still growing market for occupational doctors and safety specialists. Both services can be made available under three different types of contracts: by employing professionals like other employees, by hiring freelancers, or by contracting service companies that offer one or both of the required services. The professionals, in addition to their regular medical or technical training must pass 12 weeks (occupational medicine) and 8 weeks (safety specialist) in an institution accredited with the Ministry of Work, Health, and Social Affairs.

A3.4 Inspection

All work sites where salaried workers (there are virtually no self-employed workers in Austria's construction industry) could be present, are subject to checks by the Labour Inspectorate. The Inspectorate is a section of the ministry of work, health, and social affairs, and the country for administrative purposes of the Labour Inspectorate is split up into 17 inspection areas. Within each regional unit one or more inspectors are assigned to construction. Due to the size of the city, for Vienna an extra labour inspection for construction was set up.

Central unit: Zentrales Arbeitsinspektorat, Praterstr 31, A-1020 Vienna.
Tel +43 1 71100 0

A3.5 Insurance against work accidents and occupational diseases

Like all other workers in private enterprises, all construction workers are insured against the risks of accidents at work or on their way to work and against the risk of occupational diseases with the compulsory AUVA (General accident insurance board). AUVA in order to reduce their financial risk provides information on materials, offers training for safety representatives and safety specialists, provides professional advice to employers and in certain cases takes measurements for free. AUVA is running their own system of hospitals specialising in accidents, as well as a number of rehabilitation centres. In certain areas of health and safety AUVA carries out research through their own expert department and/or sponsors research by public and private institutions. AUVA maintains a 'central department for accident prevention and fighting against occupational diseases' (HUB) in Vienna, plus regional prevention outlets (UVDs) in Graz, Salzburg, and Linz.

Central unit: AUVA-HUB, Stifterstr 65, A-1200 Vienna. Tel: +43 1 33111 0

A3.6 Workers representation on company level and in general

Austria's 'Constitution of Labour' stipulates that workers in any private company with a minimum of 5 workers may elect members to a works council (Betriebsrat). The number of representatives to be elected, their rights, as well as the relevant procedures are regulated in the Constitution of Labour law of 1973 (Arbeitsverfassungsgesetz 1973). Once there is an elected works council, it must be recognised by the employer. It is important to understand that the rights to elect and be elected to a works council are not linked to Union membership.

A3.7 Workers representation and legal protection

Austria has an almost unique two pillar system of representation on the level of the whole economy /society: The Chamber of Labour and the Trades Union(s). Both organisations are involved in the process of developing health and safety standards and regulations.

A3.8 Chamber of Labour

By law every salaried worker and some other groups of workers are members of the 'Chamber of Labour', which provides for many different services, particularly legal counsel and representation before labour courts.

A3.9 Trades Unions/Austrian Trade Union Federation ÖGB

In parallel, workers may join the respective union (in most cases in construction that would be the construction and woodworking union — Gewerkschaft Bau-Holz). Unions are legally associations under the law regulation the formation of volunteer associations. All 14 Unions are members of the Austrian Trade Union Federation (ÖGB), and — except for the white collar workers — are organised along industrial sectors. Thus any given company normally will have to deal with 2 unions, one for white-collar workers and one for the respective blue collar workers. One major task of the unions is to represent the workers' side in the bargaining process and to sign collective agreements on wages and many other aspects of work. The other party in the collective agreement is the respective sector of the chamber of economy, which is the (also compulsory) organisation of the employers. Collective agreements are binding, also regarding workers who are not Unionised.

Author: Gerhard Elsigan, presently member of ppm research and consulting, Kaplanhofstr 1, A-4020 Linz, and member of the management team for the Linz Academy of Occupational Safety and Health. Professional background: Engineer/furniture and woodwork; sociologist.
Tel: +43 732 782078 Fax: +43 732 782078 99
e-mail: ppm.linz@ppm.at website: www.ppm.at

For further information on health research in Austria contact:

Euro Research Network
Michaela Moritz
Osterreichische Bundesinstitut tur Gesundheitswesen (OBIG)
Stubenring 6
A-1010 Wien
Austria
Tel: +43 1 515 61 28
Fax: +43 1 513 8472

Statutory Insurances
AUVA
Allegemeine Unfallversicherungsanstalt
Hauptstelle
Adalbert-Stifter-Straße 65
A-1201 Wein
Austria
Tel: +43 1331 11-0

Location of Regional Office	Geographical Extent of Region
1. Fichtegasse, Vienna	Vienna 1, 2, 3 and 20.
2. Praterstrasse, Vienna	Vienna 4, 5, 6, 10 and 11.
3. Fichtegasse, Vienna	Vienna 8, 9, 16, 17, 18 and 19.
4. Leopoldsgasse, Vienna	Vienna 7, 13, 14 and 15.
5. Belvederegasse, Vienna	Vienna 12 and 23, die Verwaltungsbezirke Bruck Leitha, Modling und Tullen; das rechts der Donaue gelgene Geviet des Verwaltungsbezirks Wien Umgebung.
6. Fichtegasse, Vienna	Vienna 21 and 22; die Verwaltungsvezirke Ganserndorf, Hollabrun, Korneuburg und Mistelbach; das links der Donau gelegene Geviet des Verwaltungsbezirks Wien-Umgebung.
7. Wr. Neustadt	Die Stadt Wiener Neustadt; die Verwaltungsbezirke Baden, Neunkirchen und Wiener Neustadt.
8. St Polten	Die Stadt St. Polten und Waidhofen a.d. Ybbs; die Verwaltungsbezirke Amstetten, Lilienfeld, Melk, St. Polten und Scheibbs.
9. Linz	Die Stadt Linz und Steyr; die politischen Bezirke Freistadt, Linz-Land, Perg, Rohrbach, Steyr-Land und Urfahr-Umgebung.
10. Salzburg	Das Land Salzburg.
11. Graz	Die Stadt Graz; die politischen Bezirke Deutschlandsberg, Feldbach, Furstenfeld, Graz Umgebung, Leibnitz, Radkersburg, Voitsberg und Weiz.
12. Leoben	Die politischen Bezirke Bruck a.d. Mur, Judenburg, Knittelfeld, Leoben, Liezen, Murzzuschlag und Murau.
13. Klagenfurt	Das Land Karnten.
14. Innsbruck	Das Land Tirol.
15. Bregenz	Das Land Vorarlberg.
16. Eisenstadt	Das Land Burgenland.
17. Krems-Stein	Die Stadt Krems a.d. Donau; die Verwaltungsbezirke Gmund, Horn, Krems a.d. Donau, Waidhofen a.d. Thaya und Zwettl.
18. Vocklabruck	Die politischen Bezirke Braunau am Inn, Gmunden, Ried im Innkreis, Scharding und Vocklabruck.
19. Wels	Die Stadt Wekls; die politishen Bezirke Eferding, Grieskirchen, Kirchdorf a.d. Krems und Wels-Land.

Figure A3.1
Organisation of the field force for health & safety in Austria

Appendix 4
Regulation of health issues in Belgium

A4.1 Belgian National Government Organisation for Health and Safety

This appendix is taken from European Commission Document Labour Inspection (Health & Safety) in the European Union (EC 1995) *with input from Veronique De Bach of Prevent, Belgium.*

Responsibility for health and safety at work in Belgium rests with the central or federal government (Figure A4.1). The department responsible for safety at work, Administration de la Securite (IS) and the department responsible for occupational health, Administration de l'Hygiene et de la Medicine du Travail (IM) are independent parts of the Ministry of Labour and Employment. Each is headed by a Director General who reports to the Minister. IS is responsible for safety in most sections of industry except those covered by the Mines Inspectorate who are part of the Ministry of Economic Affairs. IM is responsible for health protection in every sector of employment including those covered by the Mines Inspectorate. Both departments have formal links with the regional authorities through their field offices.

In addition to IS and IM an important role in the Belgian health and safety system is played by the Conseil Superieur de Prévention, Protection et du Bien-être au Travail (Supreme Council for Safety, Health and Improvement in the Workplace) — a bipartite committee which advises the Minister on proposals for legislation relating to safety, occupational health and enhancement of the working environment. It may also put forward proposals for regulations and initiate studies on any issue within its competence. The Council has a number of working groups dealing with subjects such as the use of personal protective equipment and the management of health and safety in the workplace including the content of training necessary for health and safety experts who must by law be appointed in certain enterprises. Additionally it oversees the work of a number of professional committees representing the interests of different industrial sectors such as the construction, metal, timber and chemical industries.

With a view to protecting workers' health, the work of IM includes inspection at the workplace to ensure compliance with the laws and regulations concerning the health and hygiene of employees, involvement in the prevention of occupational ill-health and ensuring employers and employees are kept informed of the potential risks to their health whilst at work. Their activities include:

- General surveillance of the health of workers.
- Surveillance of the health of those involved with ionising radiation.
- Monitoring the standards of first aid, toilet and washing facilities, clothing accommodation and canteens.
- Ensuring that appropriate personal protective equipment is provided where necessary.

- Monitoring the standards of protective measures provided when toxic substances are used.

Cases of occupational ill-health are reported to IM who carry out investigations in appropriate cases.

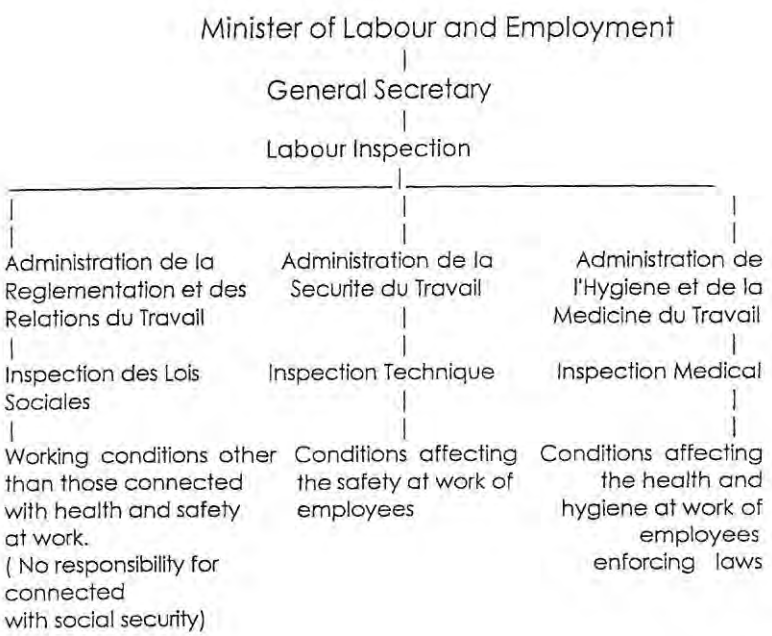
Figure A4.2 lists the locations of district offices in Belgium.

For further information on health research in Belgium contact:

Euro Research Network
Prevent, Rue Gachard 88/Bte 4, B-1050 Brussels
Belgium
Tel: +322 643 4444
Fax: +322 643 4440
e-mail: prevent@prevent.be
website: http://www.prevent.be

Further information (in French) can be obtained at
http://www.meta.fgov.be/pc/pcd/fred00.htm

Figure A4.1
Government Organisation for Labour Inspection in Belgium



Source: EC (1995)

Figure A4.2
Location of District Offices in Belgium

Administration de la Securite (IS)		
	District	**Location**
1.	Antwerp North	Antwerp
2.	Antwerp South	Antwerp
3.	Major Hazards	Antwerp
4.	Brabant	Louvain
5.	Brussels	Brussels
6.	East Flanders	Ghent
7.	West Flanders	Brugge
8.	Hainaut East	Charleroi
9.	Hainaut West	Mons
10.	Liege	Liege
11.	Luxembourg	Libramont
12.	Limbourg	Hasselt
13.	Namur	Jambes

Administration de l'Hygiene et de la Medicine du Travail (IM)		
1.	Antwerp	Limbourg, part of Brabant, Antwerp
2.	Brussels	Brussels
3.	Hainaut	Lamur West, part of Brabant, Charleroi
4.	Liege	Luxembourg, Lamur East, part of Brabant, Liege
5.	Flanders	East & West, part of Brabant, Ghent

Source: Adapted from EC (1995)

Appendix 5
Regulation of health issues in Denmark

This appendix is taken from European Commission Document Labour Inspection (Health & Safety) in the European Union (EC 1995) with assistance from Knud Overgaard-Hansen, Arbejdstilsynet Direktoratet, Landskronagade 33, 2100 København Ø.

A5.1 Danish National Government Organisation for Health and Safety

The Labour Inspectorate in Denmark is known as the Working Environment Service (Arbejdstilsynet - At).

Whilst the Ministry of Labour is the supreme administrative authority in the field of health and safety at work in Denmark, at an executive level there are three major components in the national organisation.

- The Working Environment Service (At) with a Headquarters in Copenhagen and a field force whose Director General reports to the Ministry of Labour.
- The Danish National Institute for Occupational Health, a research institute and organised into different departments concerned with research into health problems at work, with teaching and with the provision of information and consultancy.
- The Working Environment Council, a bipartite advisory council for the Ministry of Labour consisting of representatives from the employers and the Trade Unions under a chairman appointed by the Minister of Labour. The Council also has two non-voting members, experts in occupational health and safety, and receives administrative support from the staff of the At. The Council initiates discussions on matters of concern regarding occupational health and safety, participates in the development and drafting of new legislation, supervises the activities of the Trades Safety Councils and acts as the supreme authority for the Working Environment Fund. This fund is financed by employers and provides resources for information, training and research.

Figures A5.1 and A5.2 show the organisation and location of health and safety departments in Denmark.

For further information on health research in Denmark contact:

Euro Research Network
Danish Working Environment Service
Landskronagade 33
DK-2 100 Copenhagen 0
Denmark
Tel: +45 39 1 52000
Fax: +45 39 1 52560

Figure A5.1
National Organisation for Health and Safety in Denmark

Source: EC (1995)

District	Office
1. Copenhagen and Frederiksberg	Copenhagen
2. County of Copenhagen	Glostrup
3. Frederiksborg	Hillerod
4. Roskilde and Bornholm	a) Roskilde b) Ronne
5. West Zeeland	Slagelse
6. Storstrom	Nykobing Falster
7. Funen	Odense
8. South Jutland	Abenra
9. Ribe	Esbjerg
10. Vejle	Vejle
11. Ringkobing	Herning
12. Arhus	Abyhoj
13. Viborg	Skive
14. North Jutland	Alborg
15. Greenland	Nouk

Source: EC (1995) adapted by Overgaard-Hansen

Figure A5.2
Districts and District Offices for Health and Safety in Denmark

Appendix 6
Regulation of health issues in Finland

This appendix was compiled with information taken from the European Commission Document Labour Inspection (Health & Safety) in the European Union — A Short Guide (EC 1997).

A6.1 Finnish National Government Organisation for Health & Safety

The Labour Inspectorate in Finland which operates from a headquarters in Tampere and eleven independent districts throughout the country (Figure A6.1), forms part of the Ministry of Labour and is responsible through the Secretary General of Permanent Secretary of the Ministry to the Minister. Whilst the Ministry of Labour has responsibility for occupational safety and other working conditions, responsibility for all health services including occupational health rests with the Ministry of Health and Social Affairs. Enforcement, however, of the legislation dealing with both occupational health and safety and with other labour matters falls to the Labour Inspectorate.

The local government authorities have no direct involvement or responsibility for occupational health and safety.

The Inspectorate and the headquarter divisions have close cooperation and collaboration with a number of other organisations and bodies who also have an interest in health and safety at work. These are detailed below.

A6.2 Advisory Committees

Three advisory Committees have been set up by the Ministry of Labour:

- Advisory Committee on Labour Protection which has an interest in the formulation of national policies on health and safety.
- Advisory Committee on Safety Regulations which is involved in the drafting of legislation.
- Occupational and Chemical Safety which is involved in the drafting of legislation. Both the social partners are represented on these committees.

A6.3 Institute of Occupational Health

The Institute of Occupational Health is an organisation partly funded by the Ministry of Health and Social Affairs. The Ministry of Labour has a representative on the management board of the Institute. The activities of the Institute include research and the provision of occupational health services, information and training to employers and others. The headquarters and main laboratories are in Helsinki and there are six regional institutes, each with fixed and mobile laboratories provided with a wide range of sampling, measuring and analytical equipment, at Kuopio, Lappeenranta, Oulu, Tampere, Turku and Uusimaa. The staff of the Institute, numbering about 600, represent a wide range of scientific

expertise including medicine, epidemiology, psychology, chemistry, toxicology, physics and the various branches of engineering. The services they provide to industry at a cost include independent assessments of working conditions including occupational health surveys and the production of written recommendations and advice when the results of the surveys have been evaluated. About 10% of the requests for assistance from employers are as a direct result of a visit to the workplace by a Labour Inspector. In some of the larger establishments, which may have their occupational health expertise in-house, the work of the Institute could involve the development of sampling protocols for use by the hygienists at the workplace. Regular meetings are held between the staff of the regional institutes and the district labour inspectors to discuss occupational health matters and there is frequent informal contact on practical issues. From time to time, when requested, the Institute gives practical assistance at the workplace to the Labour Inspectorate.

A6.4 The Electrical Inspectorate and the Technical Inspection Centre

Until the end of October 1995 the Inspectorate and the Inspection Centre were independent inspection bodies under the umbrella of the Ministry of Trade and Industry. The Electrical Inspectorate's activities included the carrying out of periodic inspections of lifts, mobile cranes and electrical equipment which are required by law. The inspections were made either by the Inspectorate's own staff or by subcontractors whom they had accredited. The Technical Inspection Centre's main function was to inspect, test and monitor the reliability of technical equipment and plant. In November 1995 the Electrical Inspectorate was reorganised with one part being divided into two companies: one, Fimtekno Oy, being responsible for the inspection of lifts, mobile cranes and electrical installations on site and the second, Fimko Oy, having responsibility for the control of products. The remainder of the Inspectorate has been amalgamated with part of the Technical Inspection Centre to form a new Safety Technology Authority (TUKES) under the Ministry of Trade and Industry.

A6.5 The Federation of Accident Insurance Organisations

The Federation of Accident Insurance Organisations provides statistics on accident rates and causations and produces guidance material on occupational health and safety.

A6.6 The Centre for Occupational Safety

The Centre for Occupational Safety is a joint employer/employee organisation with representation from the Ministry of Labour, which is funded by the accident insurance companies. Its main activities are the training and provision of expert advice, information and guidance for safety delegates (the employees' representatives at the workplace) and safety supervisors (personnel appointed by employers to oversee health and safety).

A6.7 The Finnish Work Environment Fund

The Finnish Work Environment Fund is a tripartite body which allocates money, donated by the accident insurance bodies, to fund research projects connected with working conditions and the implementation of the results of the projects at the workplace.

The law dealing with working conditions including occupational health and safety applies to all persons working under a contract of employment. Responsibility for its enforcement, with a few exceptions, lies with the Labour Inspectorate.

The central task for the Labour Inspectorate is to monitor that the provisions of the labour protection legislation are observed and to support and encourage the development of health and safety management systems at the workplace. Additionally it is charged with giving guidance and advice to both employers and employees.

The primary legislation for occupational health and safety in Finland is the Labour Protection Act of 1958, a framework act which contains general provisions on health and safety and which enables the government to make more detailed regulations to deal with particular sectors of industry or hazards.

Employers are in general responsible under law for the health and safety of their employees, that is those persons working under a contract of employment. They also have some responsibility for members of the public whose health and safety could be directly affected by their activities. This is particularly relevant in construction work, on major hazard sites and in workplaces involved in the storage, handling and use of explosives.

There are no specific obligations placed by the legislation on the self-employed except on construction sites where they are bound by the relevant safety regulations. Whilst there are many self-employed people working in agriculture, a major industry in Finland, though the Labour Inspectorate cannot impose sanctions in their case, they do pay visits to the farms and give advice.

Following Finland's entry to the European Union, an important additional responsibility to the Labour Inspectorate has been market surveillance with the object of ensuring that products, machinery, equipment and chemicals supplied for use at work are safe and in compliance with Community requirements. Whilst the Occupational Safety and Health Division in the Ministry of Labour's headquarters has prime responsibility for this task they rely on close cooperation with field inspectors who feed back information on product safety following their visits to the workplace.

For further information on health research in Finland contact:

Euro Research Network
Irja Laamanen
Institute of Occupational Health
Topeliuksenkatu 41 aA
SF-00250 Helsinki
Finland
Tel:+358 0474 7383
Fax: +358 0474 7490

District	Office
1. Uusimaa	Helsinki
2. Turku and Pori	Turku Pori
3. Hame	Tampere Lahti
4. Kymi	Lappeenranta
5. Mikkeli	Mikkeli
6. Kuopio	Kuopio
7. Northern Karelia	Joensuu
8. Vaasa	Vaasa
9. Central Finland	Jyvaskyla
10. Oulu	Oulu
11. Lapland	Kemi

Source: EC (1997)

Figure A6.1
Field-based Occupational Health and Safety Inspectorate in Finland

Appendix 7
Regulation of health issues in France

This appendix is taken from European Commission Document Labour Inspection (Health & Safety) in the European Union (EC 1995) *with input from Jean-Luc Dumas of Technip, Paris.*

A7.1 French legislation

To cope with European Legislation, French legislation has modified the previous regulations or issued new regulations during the last few years. Some parts of this legislation apply to construction operations, especially the following documents.

Loi n° 91-1414 - 31/12/1991 concerning

- the prevention of occupational hazards
- the personal protective equipment at work
- the provision and use of work equipment
- the prevention of occupational accidents and diseases.

Loi no 93-1418-31/12/1993 concerning

- the health and safety management during construction operations.

These regulations modify, adjust and provide details to the contents of the 'Code du Travail' which is the basic document of French legislation dealing with all matters related to work.

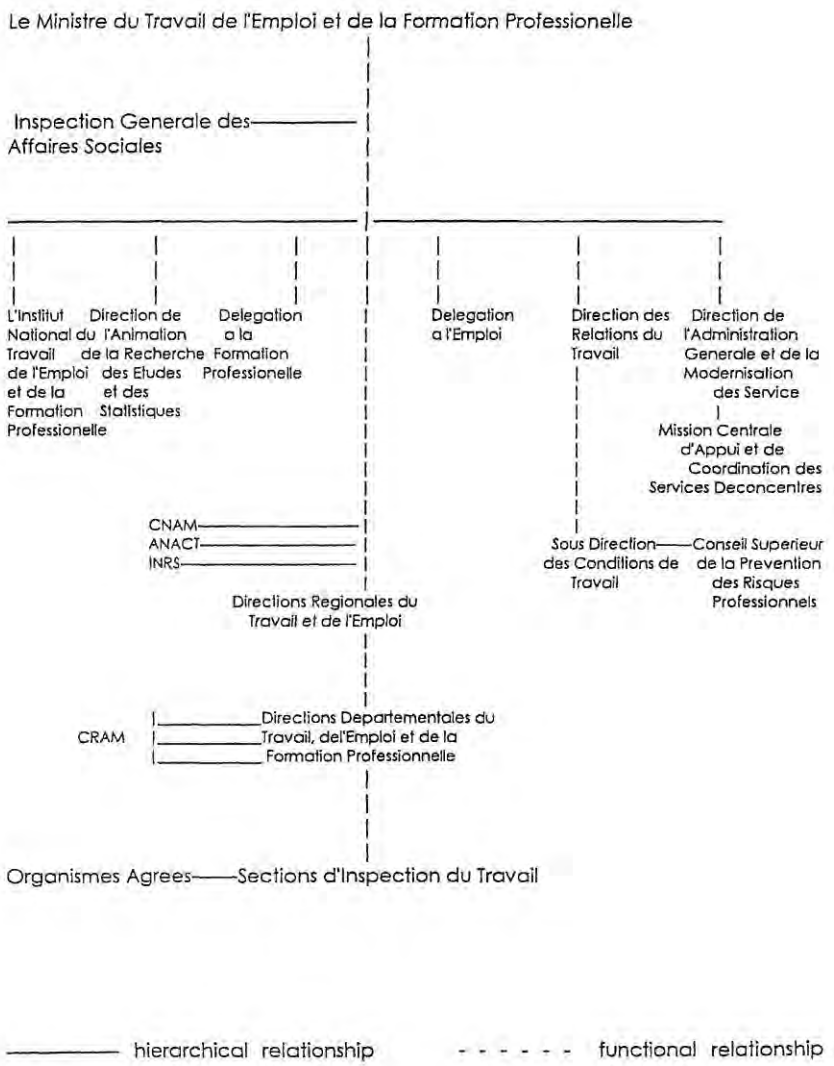
A7.2 French National Government Organisation for Health & Safety

The Labour Inspectorate in France is an inter-ministerial body common to the Ministries of Labour, Agriculture and Transport. The major responsibility for labour inspection falls to the Ministry of Labour and its Inspectorate, 'Services Déconcentrés du Travail et de L'Emploi (SDTE)', who oversee working conditions in most sectors of industry including the service industries and in commerce (See Figures A7.1 and A7.2).

In the Labour Ministry, at the central level, a sub-directorate, 'Sous - Direction des Conditions de Travail et de la Protection contre les Risques du Travail' (Sub-Directorate for Conditions of Work and Protection against Occupational Hazards) is also concerned with occupational health and safety. Its functions are:

- to develop legislation
- to oversee enforcement of the legislation
- to draw up rules concerning the organisation and operation of occupational health services

Figure A7.1
Organisation for Labour Inspection in France



Source: EC (1995)

- to liaise with other government departments and organisations on matters concerned with the improvement of working conditions
- to participate in research
- to supervise and provide technical guidance for regional medical advisers.

Figure A7.2
Location of Labour Inspectorate Regions and Offices in France

District	Office
1. Alsace	Strasbourg
2. Aquitaine	Bordeaux
3. Auvergne	Clermont – Ferrand
4. Basse Normandie	Caen
5. Bourgogne	Dijon
6. Bretagne	Rennes
7. Centre	Orleans
8. Champagne Ardenne	Chalons sur Marne
9. Corse	Ajaccio
10. DOM	Creteil
11. Franch Comte	Besancon
12. Haut Normandie	Rouen
13. Il de france	Paris
14. Languedoc Roussillon	Montpellier
15. Limousin	Limoges
16. Lorraine	Metz
17. Midi Pyrenees	Toulouse
18. Nord Pas de Calais	Lille
19. Pays de la Loire	Nates
20. Picardie	Amiens
21. Poitou Charentes	Poitiers
22. Provence Alpes Cote d'Azure	Marseille
23. RhoneAlpes	Lyon

Source: EC (1995)

In addition to the inter-ministerial Labour Inspectorate there are other bodies who have significant parts to play in the French health and safety system. They are as follows.

- Conseil Superieur de la Prevention des Risques Professionels (CSPRP) (Higher Council for the Prevention of Occupational Hazards). This is a national body with representatives from government, employers, employees and other experts, chaired by the Minister of Labour, which provides a forum for the exchange and coordination of views of the various players with an interest in health and safety at work.
- Agence Nationale pour l'Amelioration des Conditions de Travail (ANACT) (National Agency for the Improvement of Working Conditions). This is an agency set up and funded by the Ministry of Labour. This agency is governed by a council comprising representatives of employers, employees and government and independent experts. Its head office is in Paris and it has five regional offices and a total staff of about a hundred.
- Caisse Nationale d'Assurance Maladie (CNAM) (National Sickness Insurance Fund) is answerable to the Minister of Health and Social Security. The law requires all employers to have insurance cover for sickness and accidents and most have opted to join national schemes of which CNAM is by far the largest. CNAM is financed by premiums levied on employers and is

controlled by a national advisory committee with representatives of employers, the government and independent experts. The committee is supported in turn by fifteen technical committees representing different sectors of industry and formed from representatives of the social partners.

- Caisse Regionale d'Assurance Maladie (CRAM) (Regional Sickness Insurance Funds), sixteen in number, controlled and financed by CNAM.
- Caisse Primaire d'Assurance Maladie (CPAM) (Primary Sickness Insurance Funds), the third tier in the insurance system with an office in each Department.
- Organisme Professionnel de Prevention du Batiment et des Travaux Publics (OPPBTP) (Organisation for the Prevention of Accidents in Construction and Public Works), a bipartite organisation managed by a national committee with equal representation from employers and employees.

Local authorities have no direct responsibility for health and safety at work. Local fire authorities, however, do monitor in general fire precautions particularly those premises to which the general public have access.

A7.3 The INRS (Institut National de Recherche et de Sécurité pour la Prévention des Accidents du Travail et des Maladies Professionelles)

INRS is a French organisation attached to 'Sécurité Sociale' (National Health Service). The institute manages studies/research activities regarding workplace conditions, occupational health and safety, personal protective equipment, occupational diseases, safety data sheets, toxicology of chemicals involved in industries, safety of manufacturing equipment, etc.
INRS also manages occupational accident statistics for French industries and services. In addition, numerous documents, reports and magazines regarding mainly occupational health and safety are issued by INRS.

For further information contact:

INRS
30, Rue Olivier Noyer
F-75680 Paris,
France
Tel: +33(0) 140 443 000
Fax: +33(0) 140 443 041

For further information on health research in France contact:

Euro Research Network
INRS, Institut National de Recherce et de Securite
Avenue de Bourgogne
F-54501 Vandoeuvre Cedex
BP No 27,
France
Tel: +338 350 2028
Fax: +338 350 2183

Appendix 8
Regulation of health issues in Germany

This appendix was compiled by Carsten Mink of Lurgi Oel Gas Chemie GmbH

A8.1 Legislation

In almost all countries there is insurance against the risk of accidents or disease arising out of employment. But there is a great difference between the various schemes as far as responsibility for prevention, rehabilitation and compensation is concerned: state, private insurance companies or employers' associations are entrusted with the administration of industrial injuries insurance matters. It is more than a hundred years since the foundations of industrial injuries' insurance were laid in Germany. The scheme is administered jointly by employers and employees, but financial contributions are made only by employers. The system comprises prevention, rehabilitation and compensation.

The German safety and health legislative and controlling system is a dual system: the governmental institutions (Staatliche Ämter für Arbeitsschutz, Gewerbeärzte) and the statutory insurances (Berufsgenossenschaften der Bauwirtschaft (Construction Industry Mutual Accident Insurance Funds) both set standards and control them.

Governmental institutions

The governmental institutions are structured like the sixteen Federal States of Germany. They are called 'Staatliche Ämter für Arbeitsschutz' or 'Staatliche Gewerbeaufsichtsämter' (Labour Inspectorates, see Figure A8.1) and 'Gewerbeärzte' (Governmental Occupational Physicians).
A list of addresses can be found in the handbook *Betriebswacht Datenjahrbuch* (ISSN 0437-0031) issued by Hauptverband der gewerblichen Berufsgenossenschaften and published annually by:

Universum Verlagsanstalt GmbH KG
D - 65175 Wiesbaden
Germany
Tel: +49(0) 6119 030-0

Statutory insurance

Statutory insurance is regionally structured and covers specific branches. For construction there are seven regional 'Bau-Berutsgenossenschaften' and one 'Tiefbau-Berufsgenossenschaft' (which covers the whole of Germany and deals specifically with civil engineering for underground work). The seven 'Bau-Berufsgenossenschaften' are organised under the umbrella of the 'Arbeitsgemeinschaft der Bau-Berufsgenossenschaften':

Arbeitsgemeinschaft der Bau-Berufsgenossenschaften
(Working Group of Construction Industry Mutual Accident Insurance Funds)
An der Festeburg 27 - 29, D - 60389 Frankfurt am Main
Germany
Tel: +49(0) 694 705-0
Fax: +49(0) 694 705-888

Tiefbau-Berufsgenossenschaft
Am Knie 6, D - 81241 München
Germany
Tel: +49(0) 898 897-01
Fax: +49(0) 898 897-590

Legal Status

'Arbeitsgemeinschaft der Bau-Berufsgenossenschaften' is an association in matters of overlapping interests, cross-sectional tasks and common experiences of the seven 'Bau-Berufsgenossenschaften' and therefore a part of the Statutory Occupational Accident Injuries Insurance in Germany. It has been founded to coordinate all the activities for the sector of the construction industry and the building trade, particularly in the field of safety and health at work. The regulations released by the 'Bau-Berufsgenossenschaften' are called 'UVV – Unfallverhütungsvorschriften' (Accident Prevention Regulations).

Aims

The mission concerning safety and health at work is to prevent occupational accidents, diseases and health hazards by all appropriate means (including research in the field of occupational risk prevention and the improvement of working conditions), curative treatment and vocational rehabilitation of injured or diseased workers and compensation in form of cash benefits.

One example of the research field is the development of 'GISBAU', a hazardous material information system to facilitate the application of the German 'Gefahrstoffverordnung' (Hazardous Materials Act) in the Construction Industry.

Sectors of activities

Construction, Building and Woodworking Industries, Civil and Structural Engineering.

The German 'Arbeitsmedizinische Dienste der Berufsgenossenschaften'

By German law ('Arbeitssicherheitsgesetz', Occupational Safety Act) all companies in trade and industry have to engage an occupational health physician. For construction they are organised via the seven 'Bau-Berufsgenossenschaften' and the 'Tiefbau-Berufsgenossenschaft' and are called 'Arbeitsmedizinischer Dienst-AMD' (Occupational Health Service). This Service is the occupational health care unit for almost all of the German construction industry. It operates from

occupational medical centres or mobile units. Its main activity is to advise the employers on all questions of health management in construction and to cooperate with all other persons, bodies, agencies and authorities having responsibility for occupational health and safety.

Further information can be obtained from the regional offices of the Arbeitsmedizinischer Dienst der Bau-Berufsgenossenschaft located in:

- Hamburg
- Wuppertal
- Karlsruhe
- München
- Hannover
- Frankfurt am Main
- Böblingen

For further information on health research in Germany contact:

Euro Research Network
Bundesanstalt für Arbeitsschutz und Arbeitsmedizin
Friedrich-Hekdel-Weg 1-25
D-44 149 Dortmund
Germany
Tel: +49 (0)231 907 1391
Fax: +49 (0)231 907 1454

Figure A8.1
The Labour Inspectorates of the Länder and location of the administrative centres in Germany

	District	Office
1.	Baden-Württemberg	Stuttgart
2.	Bayern	München
3.	Berlin	Berlin
4.	Brandenburg	Potsdam
5.	Bremen	Bremen
6.	Hamburg	Hamburg
7.	Hessen	Wiesbaden
8.	Mecklenburg-Vorpommern	Schwerin
9.	Niedersachsen	Hannover
10.	Nordrhein-Westfalen	Düsseldorf
11.	Rheinland-Pfalz	Mainz
12.	Saarland	Saarbrücken
13.	Sachsen	Dresden
14.	Sachsen-Anhalt	Magdeburg
15.	Schleswig-Holstein	Kiel
16.	Thüringen	Erfurt

Source: EC (1995)

Appendix 9
Regulation of health issues in Greece

This appendix is taken from European Commission Document Labour Inspection (Health & Safety) in the European Union (EC 1995).

A9.1 Greek National Government Organisation for Health & Safety (Figures A9.1 and A9.2)

The Labour Inspectorate is part of the Ministry of Labour from which it receives a grant each year to enable it to carry out its functions. Three Directorates of the Ministry are involved with the Labour Inspectorate.

- Directorate of the Organisation of Labour Inspectorates, responsible for the general policy and organisation of the Labour Inspectorate nationally in all its work.
- Directorate of Working Conditions, responsible for specific policy on health and safety matters and for the execution by the Labour Inspectorate of its responsibilities to inspect, arbitrate and take punitive or remedial action. It provides information to Labour Inspectors on programmes of work to ensure consistency
- Centre for Health and Safety and Work (KYAE), responsible for providing technical, scientific and medical support to the field force including atmospheric sampling and analysis at the workplace.

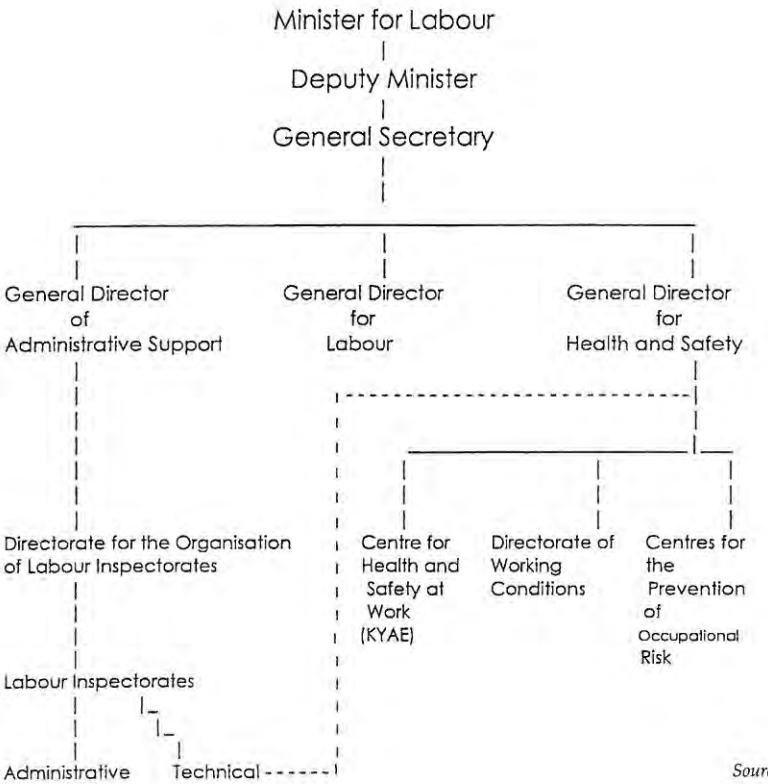
The General Director for Health and Safety who has responsibility both for the Directorate of Working Conditions and the Centre for Health and Safety at Work has direct access to the Deputy Minister of Labour.

Local authorities have no responsibility for health and safety matters at the workplace. A licence for a new workplace is issued by the Ministry of Industry, Energy and Technology with the approval both of the Ministry of Environment, Planning and Public Works and the local fire departments in-so-far as fire safety is concerned.

For further information on health research in Greece contact:

Euro Research Network
Christos Chatzis
Athens Labour Center
September Str.
Gr-10433 Athens
Greece
Tel: +30 1 883 6917
Fax: +30 1 883 9271

Figure A9.1
Ministry of Labour – Headquarters' Organisation for Working Conditions In Greece



Source: EC (1995)

Figure A9.2
Main offices of the Labour Inspectorate in Greece

Agios Nikolaos	Ioannina	Poligyros
Mexandroupoli	Kalmata	Preveza
Amfissa	Karditsa	Rethimno
Argostoli	Karpenisi	Rodos
Arta	Kastoria	Samos
Attiki — Athens	Katerini	Serres
— Piraeus	Kavala	Sparti
— Egaleo	Kerkyra	Thessaloniki
— Agia Paraskevi	Kilkis	Trikala
Chalkida	Korinthos	Tripoli
Chania	Komotini	Veria
Chios	Kozani	Volos
Edessa	Larissa	Zakynthos
Ermoupoli	Levadia	
Evros	Messolongi	
Florina	Mytilini	
Grevena	Naiplio	
Herakio	Patra	
Igoumenitsa	Pigros	

Source: EC (1995)

Appendix 10
Regulation of health issues in Ireland

This appendix is taken from European Commission Document Labour Inspection (Health & Safety) in the European Union (EC 1995).

A10.1 Irish National Government Organisation for Health & Safety (Figures A10.1 and A10.2)

The Labour Inspectorate is part of the Health and Safety Authority, the national authority for occupational safety and health, and the central body in Ireland for labour inspection activities, responsible for monitoring standards of health and safety at the workplace. The Health and Safety Authority was set up on 1 November 1989 under the Safety, Health and Welfare at Work Act. It is a tripartite body with representatives from employers, employees and government. It comprises a chairperson and ten members and is accountable to the Minister of Labour. The Authority, apart from administering and enforcing the legislation, also provides expert advice and information on occupational safety and health. It encourages the development of safety training at all levels and conducts and promotes research and studies into the prevention of accidents and diseases at work. Through the Authority the social partners have a major part to play in the development and implementation of health and safety policy at the highest level.

Fire officers employed by Local Authorities and the County Councils have responsibility for ensuring compliance at the workplace with those fire safety requirements which are associated with the premises, e.g. means of escape in case of fire, fire alarms, fire fighting equipment. However, fire hazards to personnel which arise directly as a result of the processes at the workplace remain the responsibility of the Health and Safety Authority.

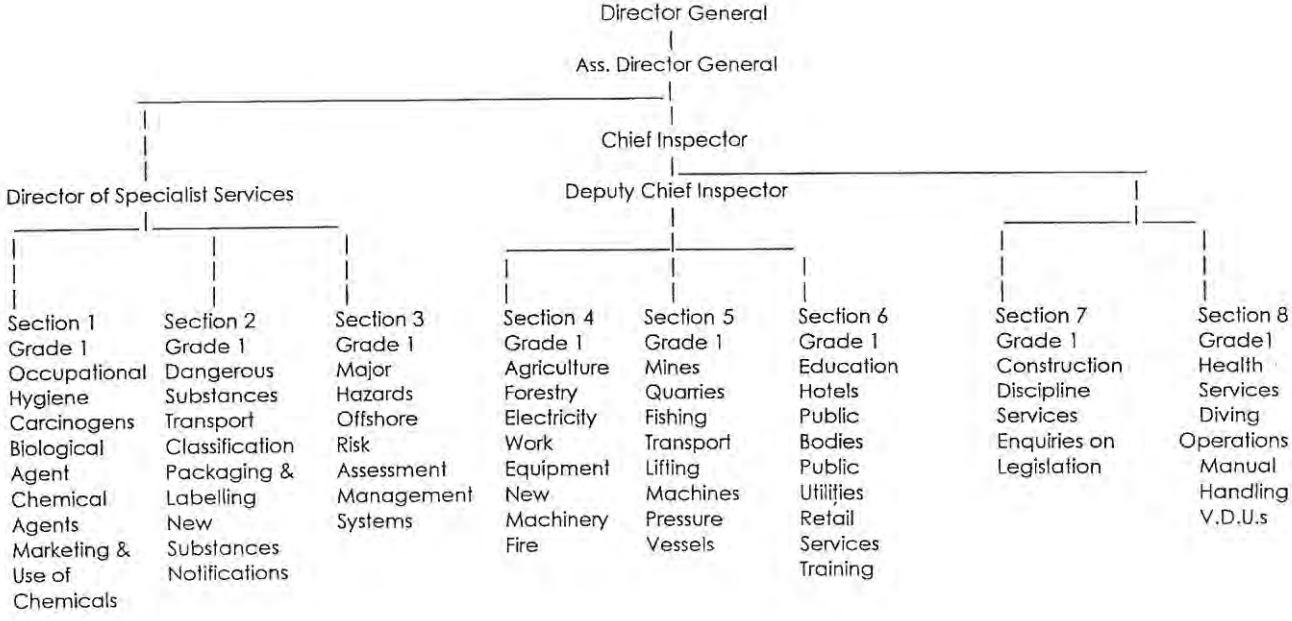
An environmental agency has been set up. Legislation for the protection of the environment is enforced by the staff of the agency and the Labour Inspectorate will have no responsibilities in this field.

Occupational ill-health is reported to the Inspectorate through the Department of Social Welfare. About a hundred cases each year are notified mainly concerned with dermatitis, occupational asthma and upper limb disorders. A percentage of the cases is selected for investigation by the doctors in the Occupational Medical Service.

For further information on health research in Ireland contact:

Euro Research Network
Health and Safety Authority
Hogan Place
IRL- Dublin 2
Ireland
Tel: +353 1 662 0400
Fax: +353 1 662 0417

Figure A10.1
Health and Safety Headquarters' Organisation for Ireland



Source: EC (1995)

Trade Unions
ETUC
Raglan Road, 19
Ballsbridge
IRL-Dublin 4
Tel: +353166806421
Fax: +353 1 660 9027

European Foundation for the Improvement of Living and Working Conditions
Wyattville Road
Loughlinstown
Co. Dublin
Ireland
Tel: +353 1 204 3100
Fax: +353 1 282 6456
e-mail: postmaster@eurofound.ie

Figure A10.2
Regional Offices of the Labour Inspectorate in Ireland

1	Waterford
2	Limerick
3	Cork
4	Galway
5	Sligo
6	Athlone
7	Drogheda

Source: EC (1995)

Appendix 11
Regulation of health issues in Italy

This appendix is taken from European Commission Document Labour Inspection (Health & Safety) in the European Union (EC 1995) *with input from Diego Bondio of Technip Italy.*

A11.1 Italian National Government Organisation for Health & Safety

Before 1978, the Labour Inspectorate, part of the Ministry of Labour and Social Security, was in charge of health and safety surveillance in the construction industry. The Inspectorate operates on a national level and has a central organisation and a regional and provincial structure (see Figures A11.1 and A11.2).

In 1978, a National Health Service was set up under the aegis of the Ministry of Health. This service was structured into local health authorities (Aziende Sanitarie Locali (ASL)) to be responsible for the health of the community, including the prevention of occupational accidents and illness, and environmental problems. The number of these units is a function of population density, which means that a specific ASL may cover more than one municipality.

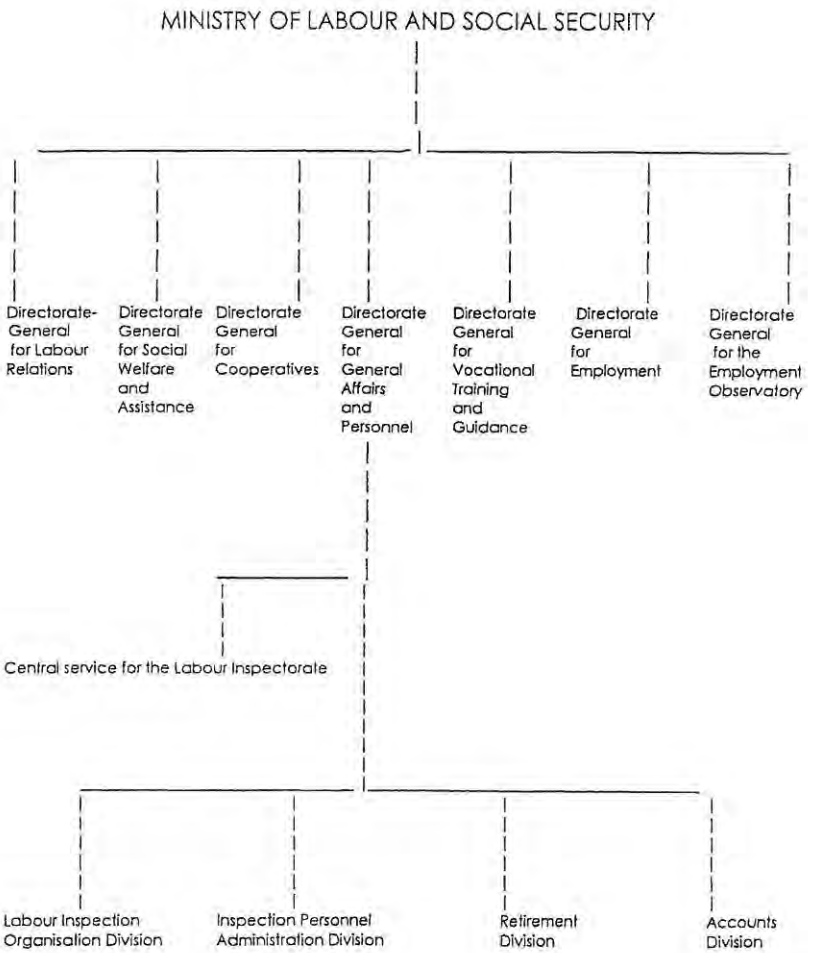
While the primary responsibility for health and safety at work lies with the Ministry of Health through the ASL, the Labour Inspectorate still retains some of its former functions including the representational role on all labour matters in the European Community.

Accident insurance is another important feature of the national health and safety system in Italy. Employers are required to insure their own employees with a public body — the NAIL (Istituto nazionale per l'assicurazione contro gli infortuni sul lavoro, the National Employment Injuries Institute) — which provides compensation for workers for injuries received through accidents at work and in cases of illness which are occupational in origin. If negligence on the part of the employer is established or if he has failed to insure with the NAIL, compensation will still be paid to the person concerned or his survivors but will be recovered from the employer by the NAIL.

For further information on health research in Italy contact:

Euro Research Network
Occupational Diseases Diagnostic Centre
USL 28, via Serlio 5/2
I-40228 Bologna
Italy
Tel: +39 51 3561 65
Fax: +39 51 3659 20

Figure A11.1
Headquarters' Organisation of the Labour Inspectorate in Italy



Source: EC (1995)

Figure A11.2
Office location for regional health & safety in Italy

	District	Office
1	Abruzzo	Aquila
2	Basilicata	Potenza
3	CalabriaReggio	Calabria
4	Campania	Naples
5	Emilia Romagna	Bologna
6	Friuli Venezia Giulia	Triest
7	Lazio	Rome
8	Liguria	Genoa
9	Lombardy	Milan
10	Marche	Ancona
11	Molise	Campobasso
12	Piemonte	Turin
13	Puglia	Bari
14	Sardinia	Cagliari
15	Sicily	Palermo
16	Tuscany	Florence
17	Trentino-Alto Adige	Trento Bolzano
18	Umbria	Perugia
19	Valle d'Aosta	Aosta
20	Veneto	Venice

Source: EC (1995)

Appendix 12
Regulation of health issues in Luxembourg

This appendix is taken from European Commission Document Labour Inspection (Health & Safety) in the European Union (EC 1995).

A12.1 Luxembourg National Government Organisation for Health & Safety

The Labour Inspectorate in Luxembourg — L'Inspection due Travail et des Mines (ITM) — forms part of the Ministry of Labour to whom its Director reports (Figure A12.1). ITM is by far the smallest of the Community Inspectorates with a total staff of 38 in inspector, controller and administrative grades. The Inspectorate has close cooperation and collaboration with a number of other organisations and government departments who also have an interest in the subject of health and safety at work. These are as follows.

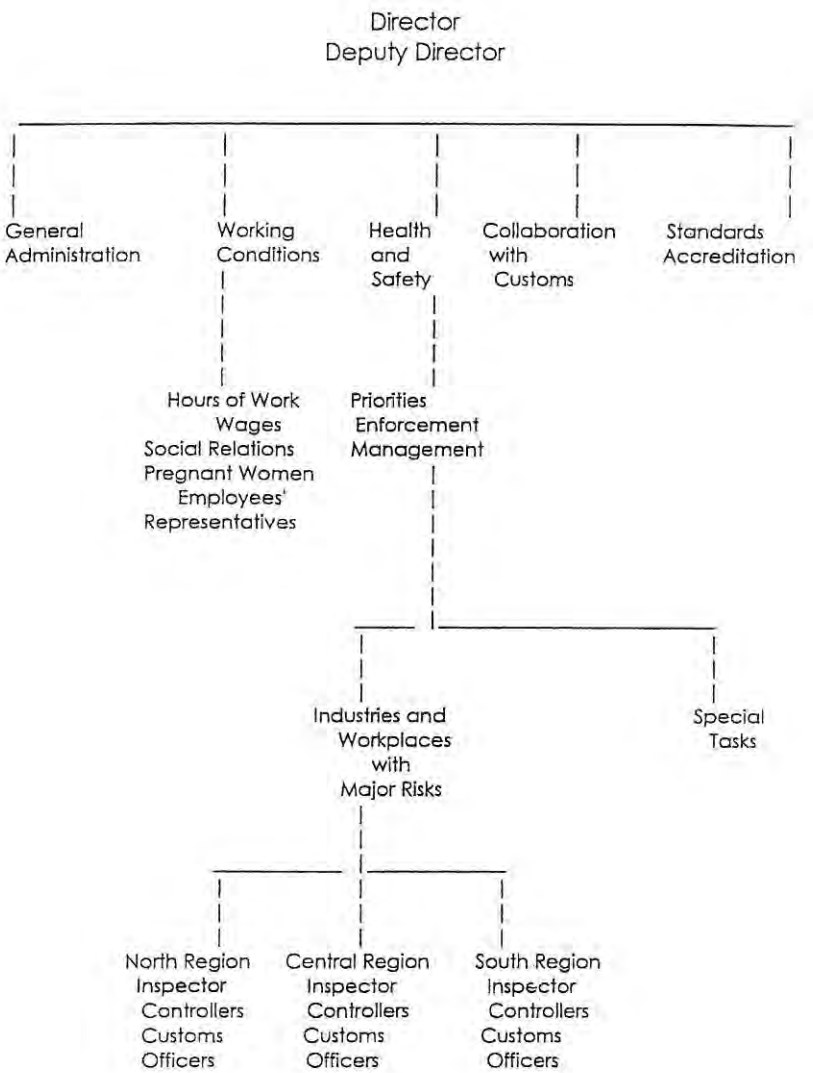
- Association d'Assurance contre les Accidents (AAA), a body who has its origins in the German insurance system and whose organisation is similar to that of the Berufsgenossenschaften (cf. Appendix 8). AAA is controlled by a management board consisting of representatives of employers and employees. It has two main sections, one covering agriculture and the second the other sectors of industry. In addition to its basic insurance function it has a preventive policy department which produces guidance both of a general and specific nature which is binding on its members. The Labour Inspectorate has to be consulted on the content of guidance before it is published. If members of the association fail to follow the guidance, they are liable to a financial penalty and the monies thus collected are used for the provision of training for safety representatives.
- The Ministry of Health, particularly with a small group of doctors whose interest lies in occupational medicine and the problems of health and hygiene at work.
- The Ministry of Public Affairs which has a small inspectorate with the responsibility of overseeing the safety of employees in the public sector including those at work in the health service and education.
- Approved technical organisations
- Agreed organisations appointed by the Minister of Labour to carry out inspections and surveys in their designated areas of competence such as pressure vessels, lifting equipment, noise and occupational hygiene.
- The Customs Service whose officers are increasingly being used to assist the Labour Inspectorate not only in administrative work involving the checking of documentation in respect of periodic inspection of plant and machinery but also in the proactive inspection of low-risk premises and of small construction sites.
- The Consultative Committee for Labour Inspection which was set up in 1983 by the Minister of Labour with a membership of twelve including representatives from employers, Trades Unions, Ministry of Labour and the Labour Inspectorate. Its function is to advise the Minister on labour matters generally including health and safety, and on the effectiveness of the current legislation in this field.

For advice on occupational health problems at the workplace consult the occupational physicians — medecins du travail — employed by the Ministry of Health

For further information on health research in Luxembourg contact:

Euro Research Network
European Commission
Ronald Haigh
DGV/F/5
Batiment Jean Monnet
L-2920 Luxembourg
Tel: +352 430 132 734
Fax: +352 430 134 511

Figure A12.1
Organisation of the Labour Inspectorate for Luxembourg



Source: EC (1995)

Appendix 13
Regulation of health issues in the Netherlands

This appendix was compiled by Dirk Hessing of ABB Lummus Global BV with some information from the European Commission Document Labour Inspection (Health & Safety) in the European Union (EC 1995).

A13.1 Dutch National Government Organisation for Health & Safety

The labour inspectorate in the Netherlands, known as the "Arbeids Inspectie" (AI) is located within the Ministry of Social Affairs and Employment. The labour inspectorate is the official body that is imposed with surveillance, and supervision of compliance to the working environment act (ARBO law). Headquarters' and regional office organisations are shown in Figures A13.1 and A13.2.

The ARBO law covers health and safety, and the Environmental law (we milieubeheer) covers the environment. Both laws are framework laws.

The ARBO law does not cover areas like mining installations and drilling works for the purpose of production or, by means of bringing soil samples to the surface, exploration of minerals, as well as the equipment and sites pertaining to those works. The mining law 'Mijnwet' falls under the Ministry of Economical affairs, surveillance and the supervision is with the Inspector General of Mines (Staatstoezicht op de mijnen). The Ministry has set rules which are laid down in the Mining Regulations and Safety Rules, the Mining Regulations 1964 and Mining Regulations Continental Shelf.

Another government organisation with influence in this field is the Social Economic Council (Social Economische Raad) (SER), a tripartite body, one of whose functions is to advise the Minister of Social Affairs and Employment on health and safety at work and working conditions in general.

The Ministry of Welfare, Health and Sports covers inspections and surveillance in areas such as the food and drugs act (waren wet), insecticides, pesticides, herbicides act (bestrijdingsmiddelen wet), the nuclear power act (kernenergie wet), the hazardous materials and dangerous substances act (wet gevaarlijke stoffen), etc.

The Ministry of Traffic and Waterways covers areas such as safety and environmental requirements, shipping traffic (act) transport dangerous substances, etc.

Others with an important role to play in health and safety are the certified organisations (ARBO Diensten) and various private sector consultancies. These give expert assistance and guidance on the assessment and management of risks to employers.

A13.2 Organisations involved in occupational health

The Arbouw Foundation

The Arbouw Foundation is the National Institute for Health and Safety in the construction industry in the Netherlands. Its main activities are research and development, information and documentation and the organisation of occupational health care for 275 000 construction workers, via 40 certified occupational health and safety centres (OHSCs). The right of every construction worker in the Netherlands to be entitled to health care is set out in Labour agreements. This care is collectively financed. The Arbouw Foundation has been collecting all the occupational health data concerning all construction workers since 1993, providing a rich source of epidemiological data to aid monitoring and surveillance purposes.

For further information contact:

Arbouw Foundation
P.O. Box 8114
1005 AC Amsterdam
The Netherlands

AVAL — welding institution

This Institution gives information, instructions and advice on safe working.

For further information contact:

AVAL
P.O. Box 75665
1070 AR Amsterdam
The Netherlands

Stoomwezen V.V

This organisation is involved in periodic inspections, for example pressure vessels, pressure piping, dangerous equipment, surveillance and approvals.

For further information contact:

Stoomwezen V.V
P.O. Box 769
3000 AT Rotterdam
The Netherlands

TNO

This organisation is involved in investigation and research science. It advises on the working environment, health care, arbo management systems, safety management and prevention.

For further information contact:

TNO
P.O. Box 6050
2600 JA Delft
The Netherlands

or:

P.O. Box 2215
2301 CE Leiden
The Netherlands

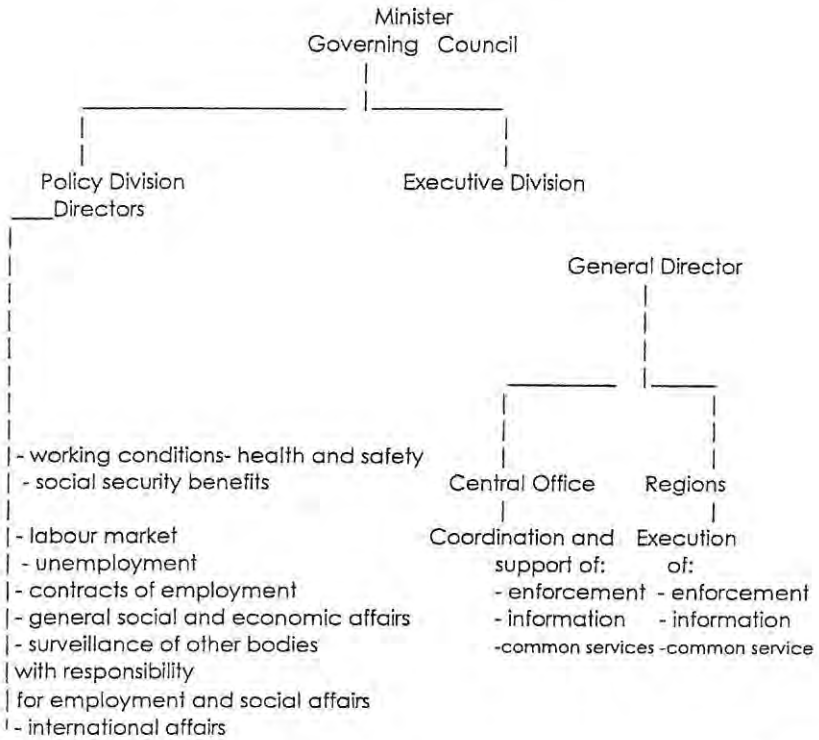
For further information on general health research in The Netherlands contact:

Euro Research Network
Ministry of Social Affairs and Employment
Directorate International Affairs
P.O. Box 90801
NL-2509 LV Den Haag
The Netherlands
Tel: +31 703 335 292
Fax: +33 703 334 007

Governments:

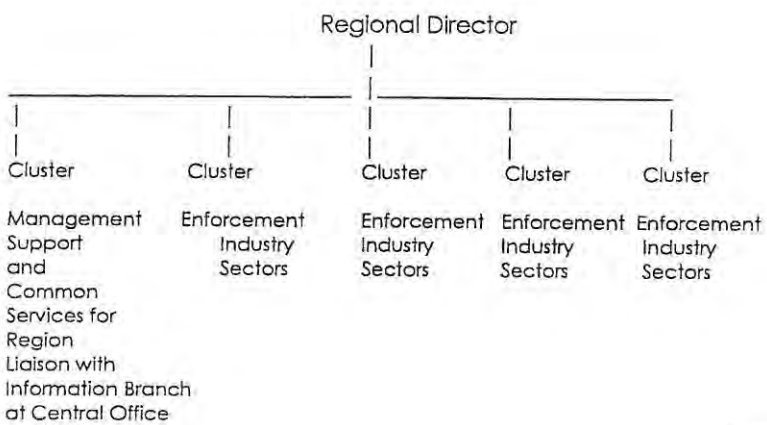
Ministry of Social Affairs and Employment
Directorate International Affairs
P.O. Box 90801
NL-2509 LV Den Haag
The Netherlands
Tel: +31 703 335 292
Fax: +33 703 334 007

Figure A13.1
Headquarters' organisation for health and safety administration in The Netherlands



Source: EC (1995)

Figure A13.2
Organisation of regional offices for health and safety administration in The Netherlands



Source: EC (1995)

Appendix 14
Regulation of health issues in Portugal

This appendix is taken from European Commission Document Labour Inspection (Health & Safety) in the European Union (EC 1995).

A14.1 Portuguese National Government Organisation for Health & Safety

The Labour Inspectorate in Portugal forms part of the Institute for the Improvement and Inspection of Working Conditions (IDICT). The Institute is a public agency and was set up by Decree-Law No. 219/93 of 16 June 1993 under the Ministry of Employment and Social Security. Its objectives are:

- To promote and assess improvements in working conditions.
- To take measures for the prevention of occupational risks.
- To promote and monitor collective agreements.
- To prevent and intervene in labour disputes.
- To enforce the legal provisions concerning working conditions, employment and unemployment.

The Institute comprises the following central departments.

- The Labour Inspectorate.
- The Directorate for Programme Development and Assessment with the responsibility of promoting policy objectives concerning risk prevention.
- The Directorate for Occupational Risk Prevention, providing technical support for the field staff and responsible for the development and distribution of guidance on health and safety matters.
- The Management Support Directorate, coordinating planning and finance for the Institute.
- A Legal Affairs Directorate.

The management structure of the Institute comprises an Executive Board, an Administrative Council and a General Council.

- *The Executive Board* consists of a president and two vice presidents, one of whom must be the Inspector General of the Labour Inspectorate. The Administrative Council comprises the president of IDICT, the vice presidents of the Executive Board, the Director of Programme Development and Assessment and the Director of Management Support. Its purpose is to oversee the planning and financial control of the Institute.
- *The General Council* is a body with advisory functions, chaired by the President of the Executive Board, with representatives from various government ministries, employers' associations together with four trades unions representatives. For its funding the Institute creates revenue of its own in addition to the funds allocated to it annually from the State budget.

The locations of regional health and safety offices in Portugal are listed in Figure A14.1.

For further information on health research in Portugal contact:

Euro Research Network
Dalia Botelho
Instituto de Desenvolvimento e Inspeccao das Condicoes de Trabalho
Ave da Republica, 84-40
P-1 000 Lisboa
Portugal
Tel:+35 1 179 73032
Fax:+35 1 179 30515

Local offices	Sub offices
Northern Region (Porto)	
Viana do Castelo	Vila Nova de Famalicao
Braga	Lamego
Braganca	Penafiel
Vila Real	
Guimaraes	
Porto	
Sao Joao da Madeira	
Central Region (Coimbra)	
Aveiro	Castelo Branco
Guarda	Figueira da Fox
Coviha	
Coimbra	
Leiria	
Viseu	
Southern Region (Lisbon)	
Almada	Barreiro
Beja	Cascais
Evora	Tomar
Faro	Torres Vedras
Lisbon	Vila Franca de Xira
Portalegre	
Santarem	
Setubal	

Source: EC (1995)

Figure A14.1
District Health and Safety Offices in Portugal

Appendix 15
Regulation of health issues in Spain

This appendix is taken from European Commission Document Labour Inspection (Health & Safety) in the European Union (EC 1995).

A15.1 Spanish National Government Organisation for Health & Safety

The Labour Inspectorate in Spain forms part of the Ministry of Labour and Social Security. Its Director General is responsible to the Vice Inspectorate. Whilst candidates for the post of Director General of the Inspectorate are initially proposed by the Minister of Labour the final appointment must be endorsed by the Cabinet of Ministers. This appointment is for an undetermined period and expires only when the Minister wishes to appoint someone in their place. The Inspectorate is responsible for ensuring the implementation of a wide range of legislation including social security, health and safety at work, industrial relations and employment (Figure A15.1).

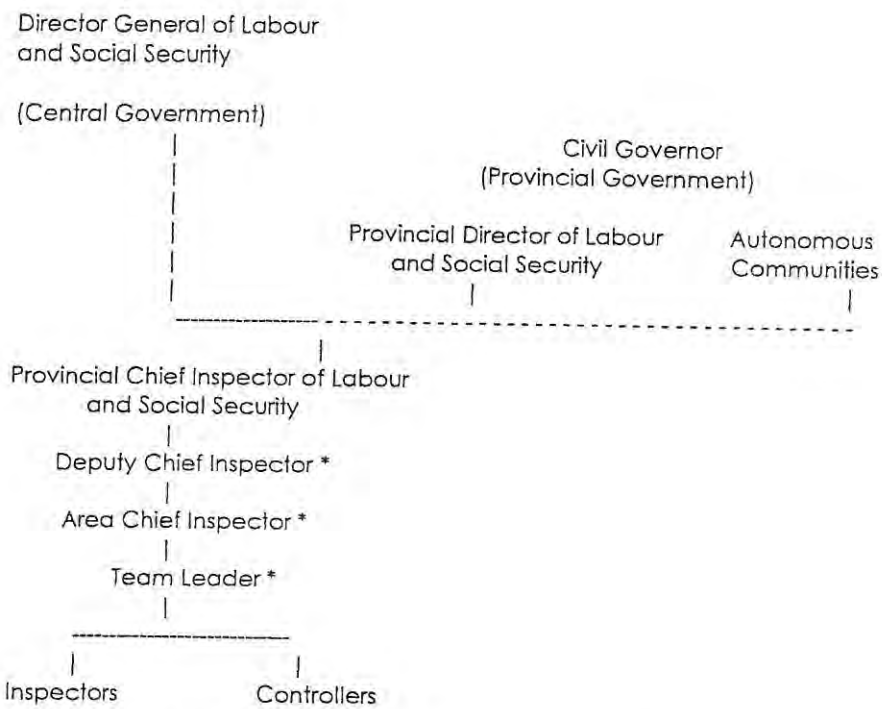
Spain is divided into seventeen autonomous communities comprising fifty two provinces. There has been some devolution of functions from central to local government and seven of the communities have now been given powers formerly held at the centre. This includes the responsibility to enforce the labour laws in the geographical areas which they cover (Figure A15.2).

Insurance organisations which provide compensation payments in the event of accidents or ill-health at work occupy an important place in the country's health and safety system. Employers and employees are required by law to make contributions to the National Institute of Social Security (Instituto Nacional de la Seguridad Social (INSS)) which provides for benefits such as old age pension and sickness and invalidity payments. Additionally, employers must secure cover for their employees for occupational accidents and ill-health either from INSS or from one of the hundred or so private insurance associations called Mutas Patronales. The latter collect premiums from their member companies and then reimburse, first, employers for wages paid to employees during an absence caused by a work-related injury or illness and then the employees themselves for any degree of disability caused by the accident or illness. They are in effect insurance agencies authorised by the Ministry of Labour and Social Security operating on a non-profit basis. Their primary role is to give financial support during absences caused by work-related accidents or illness and to manage compensation payments. They do have a preventive role but this is a secondary and very minor function in terms of the resources which they allocate to it. The National Economic and Social Council, a tripartite body with representatives from employers, employees and the government, is the national forum for consultation of all proposed legislation including that concerned with health and safety.

For further information on health research in Spain contact:

Euro Research Network
Instituto Nacional de Seguridad e Higiene en el Trabajo (INSHT)
C /Torrelaguna No 73
E-28027 Madrid
Spain
Tel: +34 140 37000
Fax: +34 140 30050

Figure A15.1
Provincial structure of the Spanish Labour Inspectorate



* Existence and number depends on size and importance of province.

Source: EC (1995)

Figure A15.2
Provincial Labour Inspectorate Offices in Spain

1.	Alava	27.	LugoOviedo
2.	Albacete	28.	Madrid
3.	Alicante	29.	Malaga
4.	Almeria	30.	MurciaPalencia
5.	Avila	31.	Navarra
6.	Badajoz	32.	Orense
7.	Baleares	33.	Oviedo
8.	Burgos	34.	Palencia
9.	Burgos	35.	Las Palmas
10.	Caeres	36.	Pontevedra
11.	Cadiz	37.	Salamanca
12.	Castellon	38.	Santa Cruz deTenerife
13.	CiudadaReal	39.	Cantabria
14.	Cordoba	40.	Segovia
15.	Coruna	41	Sevilla
16.	Cuenca	42.	Soria
17.	Gerona	43.	Tarragona
18.	Granada	44.	Teruel
19.	Guadalajara	45.	Toledo
20.	Guipuzcoa	46.	Valencia
21.	Huelva	47.	Valladolid
22.	Heuesca	48.	Vizcaya
23.	Jaen	49.	Zamora
24.	Leon	50.	Zaragoza
25.	Lerida	51.	Ceuta
26.	La Rioja	52.	Melilla

Source: EC (1995)

Appendix 16
Regulation of health issues in Sweden

This appendix is taken from European Commission Document Labour Inspection (Health & Safety) in the European Union (EC 1995).

A16.1 Spanish National Government Organisation for Health & Safety

The National Board of Occupational Safety and Health is the central authority in Sweden for matters concerning occupational health and safety. The Labour Inspectorate (Figure A16.1) comes under the jurisdiction of the Board and together with it make up the Occupational Safety and Health Administration. The Board has a Directorate of seven members including the Director General. It is a government agency and the Director General is accountable to the Minister of Labour. Members of the Directorate are appointed for a three-year term by the government. They are seen to possess general knowledge and experience of the working environment and though they may come from both sides of industry they do not formally represent the social partners in the Board's deliberations. This is a change from the situation prior to 1992 when the Board was a tripartite organisation.

The Board's Directorate meets on average once a month and is mainly concerned in its discussions with the supervision, coordination and development of activities in the occupational safety and health sector. The Board is responsible at national level for the enforcement of the Work Environment Act 1977. This is the principal piece of legislation in the occupational safety and health field which is a framework or enabling act setting objectives and outlining systems, techniques and the allocation of responsibilities for the working environment in general terms. The Act is supplemented by detailed regulations in the form of ordinances drawn up and issued by the Board, that is one of the few authorities in Sweden empowered to draft and enact this form of legislation without reference to government. However, it is obliged to consult on its proposals for ordinances with the social partners and other interested parties. In addition to its responsibilities for legislation the Board is also involved in the preparation of the annual programme of work for the safety and health administration, the preparation and dissemination of information in the occupational safety and health sector, adjudication on appeals from employers against notices issued by labour inspectors in the field and maintaining the national occupational injury database (ISA).

The Board has close cooperation and collaboration with other organisations and bodies who also have an interest in health and safety at work. These are now detailed.

A16.2 The Working Life Institute

The Working Life Institute, formerly the National Institute of Occupational Health, is Sweden's largest research body in the work environment field. The Institute

became an independent government agency under the Ministry of Labour in 1987 after previously being a research department of the Board. It receives 75% of its funding through a direct grant from the Ministry with the remainder being obtained from the Fund for Working Life and from paid research carried out for industry on a contract basis. The research carried out by the Institute focuses on a number of high priority fields such as musculoskeletal disorders, lung diseases, cancer and genetic damage, skin diseases, accidents and electromagnetic risk factors. It now incorporates the former Swedish Centre for Working Life and has thus been able to extend its research into the field of work systems and workplace issues. Training forms a further part of the Institute's responsibilities and it provides training courses for the employees of the country's occupational health services.

A16.3 The Fund for Working Life

The Fund for Working Life, formerly the Working Environment Fund, is financed by contributions from employers based on payroll. The principal aim of the Fund is to improve conditions at the workplace. It operates in four main areas namely:

- Research carried out by the Working Life Institute, universities and other research institutes in the private sector
- Development work
- Meeting the needs of the labour market
- Dissemination of knowledge.

A16.4 The Joint Industrial Safety Council

The Joint Industrial Safety Council is a joint venture by the social partners with the objective of providing information, education and training for safety delegates and members of junior and middle management. It is funded by the employers' federations and the Trades Unions together with contributions from the Fund for Working Life.

In the past inspectors appointed by the local authorities would assist the Labour Inspectorate with the inspection of certain small workplaces. This is no longer the case and the responsibilities of the 24 regions and 284 communications now lie in the areas of public health and environmental pollution and not in occupational health and safety.

The Labour Inspectorate enforces the Work Environment Act and ordinances in all places of work for which it has responsibility. The purpose of the Act is to prevent ill-health and accidents at work and generally to achieve a good working environment.

The working environment is defined quite broadly in Sweden and refers not only to the traditional physical and technical environment but also to the way work is organised, job content, working hours, opportunities for personal development, employee participation in decision making and the psycho-social aspects of the workplace.

The Work Environment Act applies to everyone working under a contract of employment and additionally, in places of education, to all pupils/students who have attained the age of seven years. It does not, however, apply to domestic staff employed in private residences. Certain parts of the Act, for example those provisions concerning machinery, other technical devices and chemical products, apply to the self-employed to safeguard their own safety and health and that of other employees who might be affected by their work activities. The control of the self-employed also has the objective of minimising the element of unfair competition which would arise were they to be exempt from providing the standards of safety and health required from other employers. The Work Environment Act does not contain any provisions regarding the safety and health of persons not in employment, for example members of the public, whose safety and health might be put at-risk as a result of work activities.

For further information on health research in Sweden contact:

Euro Research Network
Elisabeth Largerlof
National Institute for Working Life
5-17184 Solna
Sweden
Tel: +46 873 090 22
Fax: +46 873 098 88

Employers:

Eric Jannerfeldt
Representing UNICE
Swedish Employers Confederation (SAF)
S-10330 Stockholm
Sweden
Tel: +46 876 266 52
Fax: +46 876 262 90

1	Boras	7	Malmo
2	Falun	8	Stockholm
3	Goteborg	9	Umea
4	Harnosand	10	Vaxjo
5	Linkoping	11	Orebro
6	Lulea		

Source: EC (1995)

Figure A16.1
Location of Labour Inspectorate District Offices in Sweden

Appendix 17
Regulation of health issues in the United Kingdom

This appendix was compiled by Susan Fink of Masons Solicitors. In the UK the regulation of health is comprised of both statutory and common law duties.

A17.1 Statutory duties

The main source of health regulation in the UK is the Health and Safety at Work, etc. Act 1974. That Act is supported by a vast number of regulations and subsidiary legislation, including but not limited to:

- Management Of Health and Safety at Work Regulations 1992
- Workplace (Health, Safety and Welfare) Regulations 1992
- Personal Protective Equipment at Work Regulations 1992
- Manual Handling Operations Regulations 1992
- Provision and Use of Work Equipment Regulations 1992
- Health and Safety (Display Screen Equipment) Regulations 1992.

In turn these Regulations are supported by Codes of Practice and Guidance Notes, which are prepared by the enforcing authorities as an aid to implementation by employers.

Collectively, this legislation imposes duties on employers and others to identify the health hazards associated with their operations and to take reasonably practicable steps to limit the risk of injury associated therewith. Those steps might include limiting the exposure to substances/activities, the provision of personal protective equipment, mandatory health surveillance and medical examinations, etc.

The Construction (Design and Management) Regulations implement the EC (Temporary & Mobile Construction Sites) Directive. The UK Regulations have identified two parties, namely the Planning Supervisor and the Principal Contractor. These terms have been used in this manual and are defined in Chapter 2. Figures A17.1 and A17.2 compare the UK Legislation and EC Directive.

Health and safety legislation in the UK is enforced by the Health and Safety Executive and by the local authorities. To the extent that minor breaches are identified, they can be dealt with by an improvement or prohibition notice. More serious breaches can lead to criminal prosecutions before the Magistrates' Court or the Crown Court.

Currently, the maximum fine that can be imposed by the Magistrates' Court is £20 000, plus up to six months in prison. There is no limit on the fines that the Crown Court can impose for health offences, and it can impose prison sentences up to two years.

A17.2 Common law duties

In addition to their statutory duties, employers in the UK also have common law duties to ensure the health of their employees and others who may be affected by their operations. An employer who breaches those duties can be sued by the injured party and ordered to pay damages. Actions for common law breaches usually take one of three forms: negligence, breach of contract, or a civil action for breach of statutory duties.

Those actions normally must be brought within three years of either:

- the date when the cause of action came into being, or
- such later date as the injured person acquires knowledge of certain fundamental facts.

Every employer in the UK must maintain employers' liability insurance by virtue of the Employers' Liability (Compulsory Insurance) Act 1969. That insurance is intended to ensure payment in the event an employer is found liable for causing bodily injury or disease while at work. That insurance can be used to pay both the damages and the legal costs incurred that a party may incur in a civil action against the employer. It can also be used to pay the employer's costs in defending a criminal proceeding. However, it cannot be used to pay any fines or penalties that may be imposed in a criminal proceeding, as criminal penalties cannot be insured against.

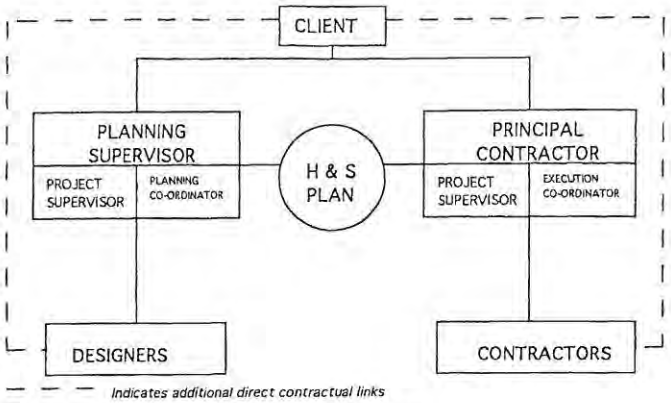
A17.3 UK National Government Organisation for Health & Safety

This section is taken from European Commission Document Labour Inspection (Health & Safety) in the European Union (EC 1995).

The aims of the HSC and the HSE are to protect the health and safety and welfare of employees, and to safeguard others, principally the public, who may be exposed to risks from industrial activity. In particular, they seek to:

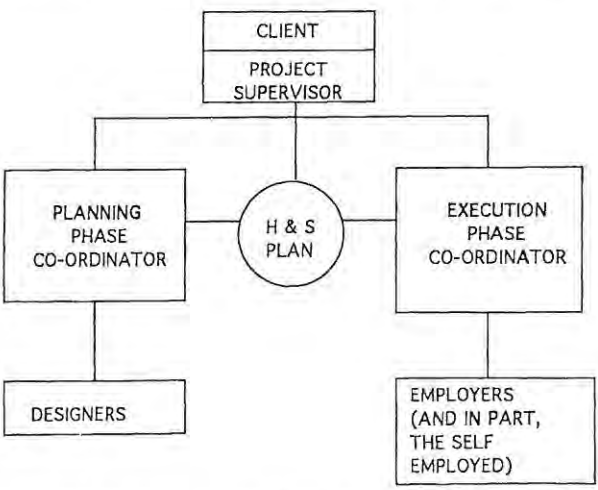
- Define standards by proposing reform of existing legislation, issuing guidance and cooperating with other standard setting bodies.
- Participate, through negotiation, in relevant standard setting in the European Community.
- Promote compliance with health and safety legislation by inspection, advice and enforcement in undertakings where the HSE is the enforcing authority and proposing and keeping under review between the HSE and other enforcement bodies with an eye to satisfactory and consistent standards.
- Carry out, publish and promote research.
- Investigate accidents and industrial health problems, disseminating findings as appropriate.
- Contribute to the process of open and democratic decision making, transparency, accountability and consistency of approach on health, safety and welfare issues by:
  - providing information and advice as required to Ministers
  - making as much information as practicable available to the public

Figure A17.1
Principal parties identified by UK legislation (Construction (Design & Management) Regulations)



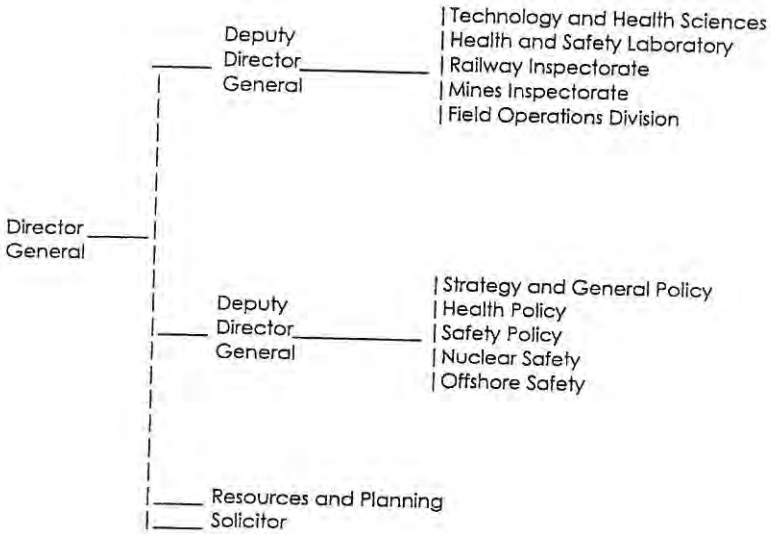
Source: EC (1995)

Figure A17.2
Principal parties identified by the EC Directive (Temporary and Mobile Construction Sites Directive)



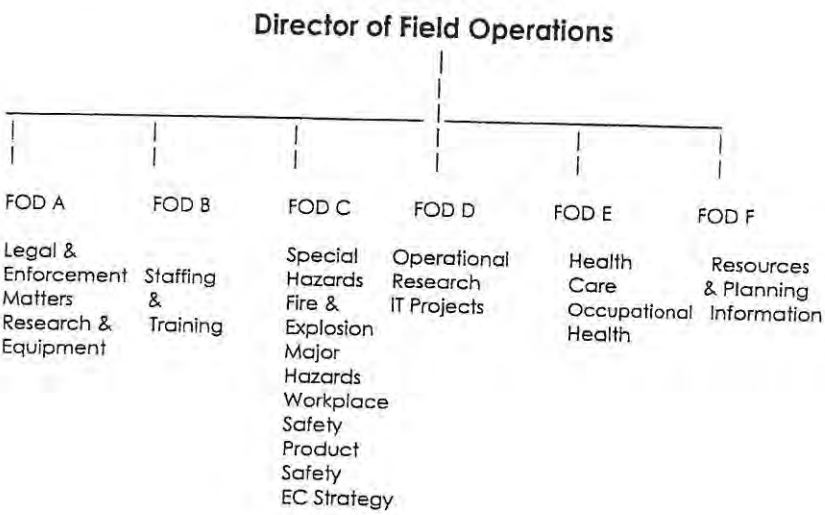
Source: EC (1995)

Figure A17.3
Organisation chart of the UK Health and Safety Executive



Source: EC (1995)

Figure A17.4
Field operations of the UK Health and Safety Executive



Source: EC (1995)

Figure A17.5
Location of UK Health and Safety Executive's Area Offices

	Region	Office
1.	South West	Bristol
2.	South	Basingstoke
3.	South East	East Grinstead
5.	London North	Barking
6.	London South	London
7.	East Anglia	Chelmsford
8.	Northern Home Counties	Luton
9.	East Midlands	Northampton
10.	West Midlands	Birmingham
11.	Wales	Cardiff
12.	Marches	Newcastle under Lyme
13.	North Midlands	Nottingham
14.	South Yorkshire and Humberside	Sheffield
15.	West and North Yorkshire	Leeds
16.	Greater Manchester	Manchester
17.	Merseyside	Bootle
18.	North West	Preston
19.	North East	Newcastle upon Tyne
20.	Scotland East	Edinburgh
21.	Scotland West	Glasgow

Source: EC (1995)

- cooperating with regulatory bodies in related fields
- representing UK interests in EC and other inter-governmental forum
- encouraging well-informed public discussion on the nature, scale and tolerability of risk.

In Northern Ireland responsibility for regulating health and safety at work lies with the Health and Safety Agency and the Department of Economic Development. Local Authorities in Northern Ireland generally have responsibilities similar to those of their equivalents in Great Britain and are accountable to the Health and Safety Agency.

Figures A17.3 – A17.5 illustrate the organization of the UK HSE.

For further information on health research in the UK contact:

Euro Research Network
Information Services Consultancy
85 The Meadows
Todwick
Sheffield
S31 0JG
United Kingdom
Tel: +44 (0)190 997 71024
Fax: +44 (0)190 997 72829

Appendix 18
Typical activities involving materials hazardous to health

This appendix includes details of typical activities involving hazardous materials and should be read in association with §3.14. The items are listed in alphabetical order of the material or operation and include the following:

- Bitumen and bitumen products
- Concrete work
- Epoxy resins
- Formwork release oils and releasing agents
- Facade cleaning
- Flooring work
- Glass cleaning
- Isocyanates
- Oils and lubricants
- Paint removal, pickling
- Paint work
- Stone conditioners and stone impregnating agents
- Synthetic mineral fibres
- Tiling work
- Timber (parquet) flooring
- Timber preservation.

A18.1 Bitumen and bitumen products

Bitumen consists of high-molecular hydrocarbons and low-molecular oils. The exact composition mainly depends on the source of the raw material and partly also on the treatment process. Products based on bitumen are used for roadside paving and construction purposes whenever sealing or water-tight components are required. Main products include:

- Bituminous roof covering and sealing materials
- Bituminous paints (emulsions and solutions)
- Sealing compounds
- Poured asphalt floor topping and others.

Until the 1970s, bitumen was blended with tar-containing products. The carcinogenic potential of blended bitumen is attributed to the polycyclic aromatic hydrocarbons (PAHs) contained in the product.

Today, bitumen is no longer classified as potentially carcinogenic since it is no longer blended with tar products. The main aspects of the health hazard of bitumen are the hydrocarbon mixes emitted in the form of steam or aerosol during the handling of the hot product, particularly in closed locations. The exact composition of these mixes is often not completely known.

With bituminous paint or sealants it has to be taken into account that the contact of bitumen with the skin could lead to acne-like skin diseases and dermatitis (see also §3.5).

A18.2 Concrete work

From a chemical point of view, concrete mainly consists of calcium silicates, calcium aluminates and calcium iron oxides and the additive calcium sulphate. A strongly alkaline mixture forms when adding water, thus involving the risk of caustic burns. In addition, concrete has a sensitising effect due to its alkalinity and chromium content.

A18.3 Epoxy resins

Epoxy resin products are increasingly used in the construction industry, mainly due to their technical characteristics, namely chemical resistance and mechanical strength. The main fields of application are coatings, e.g. flooring in industrial structures, reworking of concrete structures, adhesives for tiles and flooring materials.

Problems in handling epoxy resins are found mainly in the form of skin allergies. Contact allergies are mostly found on hands and lower arms. The amine-containing hardeners often have an irritating, caustic effect. Apart from this irritating effect the resin components may lead to skin sensitisation (see also §3.5).

A18.4 Formwork release oils and releasing agents

Releasing agents, formwork release oils and formwork releasing agents are special auxiliary materials used in the construction industry to reliably separate the formwork from partly or completely settled concrete. They are used in building construction. A film on the formwork surface prevents contact between the formwork and the concrete. All formwork release agents operate on this physical principle. They may contain additives, e.g. fatty acids, that act on the settling process at the concrete surface; they also have an additional chemical impact.

Concrete releasing agents are mainly based on mineral oil, synthetic oils, gasoline, glycols, alcohols, aromatic and halogenated hydrocarbons. The active ingredients include: paraffins, mineral waxes, vegetable waxes, metal soaps, silicon oils, non-saponifiable resins, pertluoroethers, fatty acids, fatty acid esters, triglycerides, fatty alcohols, saponifiable resins and others.

The type of application may be decisive for the respective health hazard.

- When applied manually with a cloth, sponge, spatula, brush or roller the risk of contact with the skin is particularly high. Consequently, this method should be avoided.
- When applied by broom the distance to the formwork surface is sufficiently wide. The danger of splashing is particularly high when applying the product above the head.

Working overhead should also be avoided when applying the products by a spraying device because this may additionally involve the danger of hazardous aerosols. The state of the art technology is application by a fully mechanical device, which performs all work sequences by simply changing the respective pads (i.e. cleaning and application of the release agent). With this technology, potential contact with the release agent is smaller than with the above mentioned methods.

The following health risks must be considered.

- Product splashing into the eyes may cause conjunctivitis. A variety of skin troubles can be caused by contact with the release oils (irritations of the skin, formation of eczemas, removal of the skin's natural fat).
- Inhalation of vapours and mists may lead to irritation of the respiratory tract and health damage. In enclosed locations, hazardous accumulations of gases and vapours may occur. Inhalation should be avoided at all cost since chronic damage to the respiratory organs cannot be excluded.

A18.5 Facade cleaning

Facade cleaning includes the cleaning of anodised or paint-coated metal facades, natural or synthetic stone, facing plaster, plastic and wood facings, etc. Primarily, this work covers the removal of dust, soot, slight corrosion as well as oil and grease but also paint and graffiti.

The cleaners used can mainly be divided into strongly acid or alkaline cleaners as well as solvent-laden cleaners. The health hazard of products with a very high or very low pH mainly lies in their caustic characteristics. When solvent-laden cleaners are used, a number of protective measures have to be observed. Often, these products contain dichloromethane, a substance suspected to be potentially carcinogenic.

A18.6 Flooring work

Fine grained quartz dust from the grinding of the floor topping may cause silicosis. Chromate-containing concrete-type stoppers may result in skin diseases; solvent-laden primers and adhesives may cause headaches, tiredness, numbness and even unconsciousness.

A18.7 Glass cleaning

Some glass cleaners contain caustic and toxic hydrofluoric acid. They are used to clean strongly contaminated glass fronts (corrosion). A number of accident prevention measures must be observed when handling these products.

A18.8 Isocyanates

Many products used in the construction industry contain polyurethane plastics, e.g. insulating materials, coatings, paints, adhesives, wood floor sealants, erection foams, joint fillers and sealing compounds.

These products often contain cyanates in the form of tolylenediisocyanate (TDI) and diphenylmethane diisocyanate (MDI). Polyetherpolyoles constitute the second reaction component while further components include propellant gases (propane, butane, dimethylether) as well as small amounts of catalysts, flame retardants and other auxiliaries.

Isocyanates are primarily known for their irritating effect on the eyes, skin (contact allergies) and mucous membranes. In addition, they are sensitizing, i.e. they may cause allergies upon inhaling or skin contact — particularly 'isocyanate asthma'.

The symptoms of these respiratory tract problems such as coughing, shortness of breath, etc. may lead to severe physical and psychic stress to the person affected. Moreover, the often used MDI is rightly suspected of having a carcinogenic effect when found in the form of aerosols.

A18.9 Oils and lubricants

Fats, oils, hydraulic oils and lubricants are required for the maintenance of the various construction machines and transport vehicles.

Health hazards due to the inhalation of vapours mainly only arise in case of defects when larger amounts have spilled and must be removed and disposed of. Damage to the skin would primarily occur when the products have been spilled or inadequately handled.

A18.10 Paint removal, pickling

Strongly alkaline pickling solutions may cause caustic burns of the skin and pickling solutions containing chlorinated hydrocarbons may irritate the skin, eyes and mucous membranes as well as damage the central nervous system. Moreover, some compounds are said to be potentially carcinogenic.

A18.11 Paint work

Depending on the type of organic binder used (alkyd resin, acrylic resin, synthetic resin), paints and coatings contain solvents and/or water, pigments, fillers and other additives. The main hazards in the paint and varnishing trade lie in the solvent-dilutable paints. The following aromatic hydrocarbons may be found, among others: ethyl benzene, xylene, isopropyl benzene and mesitylene. The total content of aromatic solvents ranges between 1 and 10 %. Toluene and benzene may be found as contaminants.

Health hazards are found when inhaling solvent vapours or aerosols by ingestion, intake through the skin and direct contact with the eyes.

The inhalation of solvent vapours or aerosols may lead to irritation of the respiratory and digestive organs, vertigo, intoxication, headaches and numbness. Continuous contact with the skin may cause irritation, inflammation and degreasing. Skin resorptive substances, particularly xylene,

ethylbenzene and isopropylbenzene, may further aggravate the symptoms described above or cause them to occur at lower concentrations.

A18.12 Stone conditioners and stone impregnating agents

Stone compactors are products to compact/condition, weathered and crumbling stone facades. Apart from solvents (acetone, butanone, ethanol and toluene or hydrocarbon mixtures) they also contain an organic silicic acid ester. Furthermore, they may also contain organic tin compounds (toxic, skin-resorptive) and alkylalkoxysiloxanes. In addition to the hazardous effects of the solvent, the tetraethylsilicate may cause damage to the lungs and larynx.

Stone impregnators are products that provide mineral substrates with a water, oil, colour and contaminant-proofing coat. In addition to a large amount of organic solvents (often up to 95%, e.g. alcohols, ethylacetate, heptane, toluene, xylene) they contain alkylalkoxysilanes, alkylalkoxysiloxanes or polysiloxanes and possibly also organic tin compounds.

The health hazard mainly derives from the high solvent concentration.

A18.13 Synthetic mineral fibres

Synthetic mineral fibres mainly cover two groups:

- Mineral wool insulation material (glass wool, mineral wool; 98% market share)
- Ceramic fibre products (2% market share).

Both groups contain breathable fibres. This factor quickly contributed to an association of the structure with the product's carcinogeneity and to the classification of the fibres as substances suspected to be potentially carcinogenic. However, the effect of fibre-type particles in the lungs has not yet been fully researched.

All types of fibres may be carcinogenic provided that they are:

- A certain diameter ($< 3\,\mu m$)
- A certain length ($> 5\,\mu m$)
- A certain ratio between length and diameter ($> 3:1$)
- To a certain extent resistant in the human body

A18.14 Tiling work

Even floor tilers are affected by the use of hazardous materials. The main impact is damage to the skin due to the handling of concrete-containing products (strongly alkaline reaction of the aqueous solution, chromate-containing components) and reaction resins (may cause allergies). However, irritation of the respiratory tract caused by solvent-laden fillers (acetic acid, 2-methylethyl ketone oxime, methanol, 2-methoxyethanol, butylamines, cyclohexylamine and others) can also be found. 2-methoxyethanol constitutes a serious health hazard because it affects the genes, i.e. it can impair fertility and affect the health of foetuses.

A18.15 Timber (parquet) flooring

Dust from oak and beech wood, from the sanding of parquet floor and other timber flooring may lead to the formation of malignant tumours inside the nose (adenocarcinomas). Other wood dust types are suspected to be carcinogenic. Solvent-laden wood mastics and agents for surface treatment may irritate the respiratory and digestion tracts, cause vertigo, intoxication, headaches and numbness.

A18.16 Timber preservation

Water-soluble wood preservatives may contain inorganic boron compounds, silicofluorides (skin irritation), hydrogen fluorides (caustic burns), chromium(VI) compounds (carcinogenic in the form of breathable dusts/aerosols) and hazardous copper compounds.

Oily wood preservatives may contain solvent mixes, tar oils and derivatives of coal tar (skin irritation and skin cancer).