



Guidelines to the Safety, Health and Welfare at Work (Chemical Agents) Regulations, 2001

(S.I. No. 619 of 2001)

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HEALTH AND SAFETY AUTHORITY

**GUIDELINES TO THE
SAFETY, HEALTH AND WELFARE AT WORK
(CHEMICAL AGENTS) REGULATIONS, 2001**

(S.I. No. 619 of 2001)

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INTRODUCTION

The Safety, Health and Welfare at Work (Chemical Agents) Regulations, 2001 give legal effect to Council Directive 98/24/EC. These guidelines emphasise, in particular, the importance of the performance of adequate and appropriate risk assessment as laid down in Regulation 4 of the Regulations. In addition, the broadening of the scope and the application of the Regulations to all workplaces has important and widespread implications for all workplaces and employers. The aim of these guidelines is to assist in the understanding and implementation of the requirements and responsibilities as set out in the Chemical Agents Regulations. In addition, the Regulations are more prescriptive than previous legislation regarding the issue of health surveillance. A section of the guidelines covers this issue.

The overall purpose of the guidelines is to give general guidance on the prevention of risks to safety and health related to exposure to dangerous chemical agents at the workplace.

The guidelines are not intended as a legal interpretation of the Chemical Agents Regulations.

The Regulations are made under the Safety, Health and Welfare at Work Act, 1989 and are also linked to the requirements in the Safety, Health and Welfare at Work (General Application) Regulations, 1993, (S.I. No. 44 of 1993), as amended.

The Regulations, which came into effect on 19 December 2001, revoked the Safety, Health and Welfare at Work (Chemical Agents) Regulations, 1994 (S.I. 445 of 1994); the European Communities (Protection of Workers) (Exposure to Lead) Regulations, 1988 (S.I. No. 219 of 1988); the European Communities (Protection of Workers) (Exposure to Chemical, Physical and Biological Agents) Regulations, 1989 (S.I. No. 251 of 1989); and the Safety, Health and Welfare at Work (Control of Specific Substances and Activities) Regulations, 1991 (S.I. No. 285 of 1991).

The Regulations set down obligations on employers regarding the determination and assessment of risk of hazardous chemical agents; the prevention and control of exposure to hazardous chemical agents; specific protection and preventive measures; arrangements to deal with accidents; incidents and emergencies; information training and consultation; health surveillance (including biological monitoring and exposure records). In addition, the Regulations set out duties for employees and provide for prohibitions and exemptions relating to the production, manufacture, or use of specified chemical agents.

CHAPTER 1

INTERPRETATION AND APPLICATION

Interpretation: (Regulation 2)

The following definitions set out in Regulation 2 of the Safety, Health and Welfare at Work (Chemical Agents) Regulations, 2001 are also applicable to these guidelines.

“Act” means the Safety, Health and Welfare at Work Act, 1989 (No. 7 of 1989);

“Activity” means any work in which chemical agents are used, or are intended to be used, in any process, including production, handling, storage, transport or disposal and treatment, or which result from such work;

“Approved” means approved in writing for the time being by the Authority or conforming with a specification in writing by the Authority;

“Authority” means The National Authority for Occupational Safety and Health;

“Biological limit value” means the limit of the concentration in the appropriate biological medium of the relevant agent, its metabolite, or an indicator of effect;

“Chemical agent” means any chemical element or compound, on its own or admixed, as it occurs in the natural state or as produced, used or released, including release as waste, by any work activity, whether or not produced intentionally and whether or not placed on the market;

“Code of Practice” means a code of practice issued under Section 30 of the Act;

“Employer” means without prejudice to the interpretation in the Act and for the purposes of these Regulations, any employer of employees who are, or are likely to be, exposed to a chemical agent or hazardous chemical agent as a result of their work;

“Hazard” means the intrinsic property of a chemical agent with the potential to cause harm;

“Hazardous chemical agent” means:

- (i) any chemical agent which meets the criteria for classification as a dangerous substance according to the criteria in Annex VI to Directive 67/548/EEC¹, whether or not that substance is classified under that Directive, other than those substances which only meet the criteria for classification as dangerous for the environment;*
- (ii) any chemical agent which meets the criteria for classification as a dangerous preparation within the meaning of Directive 99/45/EC², whether or not that preparation is classified under that Directive, other than those preparations which only meet the criteria for classification as dangerous for the environment;*

¹ O.J. No. 196, 16.8.1967, P1

² O.J. No. L 200, 30.7.1999, P1

- (iii) *any chemical agent which, whilst not meeting the criteria for classification as dangerous in accordance with (i) and (ii), may, because of its physico-chemical, chemical or toxicological properties and the way it is used or is present in the workplace, present a risk to the safety and health of employees, including any chemical agent assigned an Occupational Exposure Limit Value in the relevant code of practice to these regulations;*

“Health surveillance” means for the purposes of these Regulations, the assessment of an individual employee to determine the state of health of that individual, as related to exposure to specific chemical agents at work and includes biological monitoring;

“Occupational exposure limit value” means, unless otherwise specified, the limit of the time-weighted average of the concentration of a chemical agent in the air within the breathing zone of a worker in relation to a specified reference period, as approved by the Authority;

“Occupational healthcare professional” means a registered medical practitioner or other suitably qualified person employed, or otherwise engaged, by an employer to be responsible for health surveillance of employees covered by these Regulations;

“Principal Regulations” means the Safety, Health and Welfare at Work (General Application) Regulations, 1993 (S.I. No. 44 of 1993) as amended by the Safety, Health and Welfare at Work (General Application) (Amendment) Regulations, 2001 (S.I. No. 188 of 2001); [referred to in these guidelines as the “General Application Regulations”]

“Risk” in relation to the exposure of an employee to chemical agents, means the likelihood that the potential for harm will be attained under the conditions of use and/or exposure, and also the extent of that harm.

Application:
(Regulation 3)

- (1) *The requirements of these Regulations apply where hazardous chemical agents are present or may be present in the workplace, without prejudice to the provisions for chemical agents to which measures for radiation protection apply under the Directives adopted under the Treaty establishing the European Atomic Energy Community.*
- (2) *For carcinogens present or likely to be present in the workplace; the requirements of these Regulations apply without prejudice to more stringent or more specific provisions contained in Council Directive 90/394/EEC³ on the protection of workers from the risks related to exposure to carcinogens, as amended by Council Directives 97/42/EC⁴ and 99/38/EC⁵.*
- (3) *The requirements of these Regulations apply to the transport of hazardous chemical agents by road, rail, sea or air, without prejudice to more stringent or more specific provisions contained in Council Directive 94/55/EEC⁶ on the approximation of the laws of the Member States with regard to the transport of dangerous goods by road, as amended; Council Directive 96/49/EEC⁷ on the approximation of the laws of the Member States with regard to the transport of dangerous goods by rail, as amended; Council Directive 93/75/EEC⁸ concerning minimum requirements for vessels bound for or leaving Community ports and carrying dangerous or polluting goods, as amended; and in the technical instructions for the safe transport of dangerous goods issued by the International Civil Aviation Organisation.*
- (4) *These Regulations shall apply to a self-employed person as they apply to an employer and as if that self-employed person was an employer and his or her own employee.*
- (5) *These Regulations shall apply to an employer in respect of the use by him or her of the services of a fixed-term employee or a temporary employee, as interpreted in Regulation 2 of the Principal Regulations and taking into account the provisions of Regulation 4 of those Regulations.*
- (6) *Where duties, however expressed, are placed by these Regulations on an employer in respect of any of his or her employees at a workplace, he or she shall be under a like duty in respect of every other person at work at that workplace who is, or may be exposed, at that place to a chemical agent or hazardous chemical agent as interpreted in Regulation 2, except that the duties under Regulation 10 shall not apply to persons who are not his or her employees."*

The Regulations apply to all employers and the self-employed. In addition, it is important to note that the obligations and responsibilities of the Regulations may also apply to others such as contractors, sub-contractors etc. and to their employees working at their own or another employer's premises. Each employer concerned has duties to his or her own employees, and so far as is reasonably practicable, to the employees of the other employer. This may involve the need to co-operate and collaborate to ensure that all employees who may potentially be exposed to hazardous chemicals agents are protected, so as to prevent or reduce exposure to as low a level as is reasonably practicable, or to protect those employees by providing adequate control measures to reduce the risk should such exposures occur.

³ O.J. No. L 196, 26.7.1990, P1

⁴ O.J. No. L 179, 8.7.1997, P4

⁵ O.J. No. L 138, 1.6.1999, P66

⁶ O.J. No. L 319, 12.12.1994, P7-13

⁷ O.J. No. L 235, 17.09.1996, P25-30

⁸ O.J. No. L 247, 05.10.1993, P19-27

CHAPTER 2

SCOPE OF THE REGULATIONS

Introduction

This chapter covers general information about hazardous chemical agents which can be of assistance in identifying whether or not the requirements of the Chemical Agents Regulations apply with respect to the agents present at a workplace (i.e. to assist in clearly outlining the scope of the Regulations). It indicates the range of chemical agents that are relevant to the Regulations; the duties of employers, the self-employed and employees; and the duties of employers and employees working at other premises.

2.1 Chemical agents and hazardous chemical agents

The Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001 apply to a very wide range of substances and preparations (i.e. a mixture of two or more substances) with the potential to cause harm if they are inhaled, ingested or come into contact with, or are absorbed through the skin. These include individual chemical substances or preparations such as paints, cleaning materials, metals, pesticides and insecticides. Chemical agents or hazardous chemical agents can occur in many forms, e.g. solids, liquids, vapours, gases, dusts, fibres, fumes, mist and smoke.

Chemical Agents covered by the Regulations include:

Any chemical element, compound, mixture, preparation etc. in any form, naturally or artificially produced or introduced (intentionally or otherwise) to the workplace or generated at the workplace, released as a by-product, residue or waste, whether or not it is placed on the market.

Hazardous Chemical Agents covered by the Regulations, which could be considered to be a subset of the term "Chemical Agent" and are likely to cause harm to health should exposure occur (dependent on the risk), include:

- (a) Any substance classified as dangerous in accordance with EU classification criteria as implemented by Council Directive 67/548/EEC⁹, except for those substances that are solely classified as dangerous with respect to the environment. These include substances that are classified as very toxic, toxic, harmful, corrosive, irritant, sensitising, carcinogenic, mutagenic or toxic to reproduction.
- (b) Any preparation that is classified as dangerous in accordance with EU classification criteria for preparations as implemented by Council Directive 99/45/EC¹⁰, except for those preparations that are solely classified as dangerous with respect to the environment.
- (c) Any chemical agent which, (while not formally classified as dangerous using EU classification criteria), can cause harm by virtue of its physico-chemical or toxicological properties, including those agents that can be considered dangerous by virtue of the way they are used in the workplace.

⁹ O.J. No. 196, 16.8.1967, P1

¹⁰ O.J. No. L 200, 30.7.1999, P1

- (d) Any chemical agent assigned an Occupational Exposure Limit Value (OELV) as listed in the current Code of Practice on Chemical Agents.

A chemical which, whilst not meeting the criteria for classification as dangerous in accordance with the above, may, because of its physico-chemical, chemical or toxicological properties and the form in which it may occur in the work activity, present a risk to the safety and health of employees, including any chemical agent assigned an Occupational Exposure Limit Value (OELV) as laid down in the 2002 Code of Practice to the Chemical Agents Regulations or any subsequent revision of that Code of Practice.

It should be noted that a hazardous chemical agent(s) need not be just a single chemical compound, but also includes mixtures of compounds, allergens, etc. For example, dusts of any kind are considered hazardous to health when they are present in concentrations in the air equal to or greater than 10 mg/m³ for inhalable dusts or 4.0 mg/m³ for respirable dusts i.e. dependent on the particle size of the dust. The definitions of "inhalable dust" and "respirable dust" are included in the European Standard approved by the European Committee for Standardization (CEN).

Gases and vapours when present at high concentrations in air at the workplace act as simple asphyxiants. These can reduce the oxygen content to such an extent that life cannot be supported. Many of these asphyxiant gases are odourless and colourless and not readily detectable. Therefore, monitoring the oxygen content of the air is a means of ensuring that their presence does not pose a risk to the health of employees.

Some of the gases concerned are extremely flammable and can present a risk of fire or explosion. These flammable or asphyxiant gases satisfy the definition of hazardous chemical agent as set out in the Regulations. Where these gases are used in the workplace, employers will need to assess the risks they may pose to the health and safety of employees under both the Safety, Health and Welfare at Work (Chemical Agents) Regulations, 2001 and the Safety, Health and Welfare at Work (General Application) Regulations, 1993-2003. The requirements of the Safety, Health and Welfare at Work (Confined Spaces) Regulations, 2000 may also apply to the use of asphyxiant and flammable gases and employers may have further duties under those Regulations.

When deciding whether the substances used or produced in the workplace are covered by the Chemical Agents Regulations, 2001, employers should also consider the following:

- different forms of a substance may present different hazards, e.g. substances may not be hazardous in solid form but may be hazardous when ground into powder or dust that can be breathed into the lungs;
- impurities in a substance can make it more hazardous, e.g. crystalline silica is often present in minerals which would otherwise present little or no hazard;
- some substances have a fibrous form which may present a potentially serious hazard to health, if the fibres are of a certain size or shape;
- some substances have a known health effect, but the mechanism causing it is unknown, e.g. certain dusts of textile raw materials cause byssinosis;
- exposure to two or more substances at the same time or one after the other may have an added or synergistic effect;

- epidemiological or other data, e.g. reports of illness due to new and emerging agents;
- one-off, emergency situations arising out of the work activity, such as a dangerous chemical reaction or fire which could foreseeably produce a hazardous chemical agent(s).

The scope of the Regulations is very wide and covers hazardous agents which, at first, may not be even considered to be “chemicals” in the traditional interpretation or perception of that meaning or definition. Therefore, it is essential that employers consider the full life cycle and use of chemicals at the workplace, including the potential for emergencies and accidents/incidents to occur.

2.2 Where to find out more about hazardous chemical agents

There are many sources of information that employers can use to find out more about the hazardous properties of substances. These include:

- labels and safety data sheets in accordance with EU legislative requirements (for hazardous substances and preparations);
- from self-classifying substances or preparations by applying the criteria in the Regulations, i.e. when the agent has not formally been classified in accordance with the EU criteria but is known to potentially cause harm should exposure occur;
- other information provided by the manufacturer or supplier of the substance under Section 10 of the Safety, Health and Welfare at Work Act, 1989;
- guidance published by the Authority or other authoritative organisations;
- risk assessment reports published by the European Union on specific chemical substances performed in accordance with Council Regulation (EEC) 793/93 on the evaluation and control of risks of “existing” substances;
- previous experience of using the substance, similar substances, or agent;
- technical reference sources (textbooks, scientific and technical papers, trade journals, etc.);
- professional institutions, trade associations, trade unions and specialist consultancy services;
- the Internet.

2.3 The Workplace

The “workplace” refers to the place of work as defined under the Safety, Health and Welfare at Work Act, 1989, in particular, including any place (whether or not there is a structure at that place), whereby work is carried on, whether occasionally or otherwise. It includes a premises e.g. factory, warehouse etc., an installation on land and any off-shore installation, a tent, temporary structure or movable structure, a vehicle, vessel, or aircraft, common parts of shared buildings and can include public roads e.g. road repair or resurfacing, kerbstone cutting, line painting, etc.

2.4 Working at another employer's premises

Contractors, sub-contractors and self-employed people all have the duties of employers under the Regulations. Where the employees of one employer work at another employer's premises, both employers have duties under the Regulations (and also under other legislation). Each employer has duties to their own employees and, so far as is reasonably practicable, to the employees of the other employer.

2.4.1 The visiting employer

When working at another employer's premises, the two employers should co-operate and collaborate to ensure that all the duties imposed by the Chemical Agents Regulations and Regulation 6 of the General Application Regulations are fulfilled. They may need to decide which of them will carry out a particular duty. For example, it is usually appropriate for the employer who creates the risk to carry out any necessary monitoring of exposure. With respect to the issue of health surveillance (if required) then the employer should arrange for health surveillance for his/her own employees. However, on larger sites (with one or more sub-contractors) the main contractor may decide to take overall charge to arrange for health surveillance for all persons on site who are exposed and require such surveillance. This co-operation should be clearly outlined and planned with a clear understanding as to where responsibilities lie between each employer.

2.4.2 The employer occupying the place of work

The employer occupying the premises should also provide the visiting employer with sufficient information about any chemical agents that could be hazardous to health that may be used or produced at the place of work. The information provided by the employer should be sufficiently detailed to allow the visiting employer to provide his or her own employees with information and any appropriate instruction necessary to comply with the occupying employer's control measures.

The employer at the place of work will also need to know about any chemical agents, which could be hazardous to health, that are likely to be used or produced by the work that the visiting employer will be doing. This information is essential so that the occupier employer can:

- (a) be satisfied that the measures put in place by the visiting employer will not only protect his/her own visiting employees from exposure to the substances concerned, but also the occupier's employees;
- (b) provide his or her own employees with information and instruction about any chemical agents which could be hazardous to health that the other employer will be using or the work activity being performed will produce; and
- (c) reassure his or her employees that any exposure to the substances concerned and any risks to their health are being properly controlled.

2.4.3 People working under the control and direction of others

Although only the courts can give an authoritative interpretation of the law, in considering the application of the Chemical Agents Regulations and the development of guidance to persons working under another's direction, the following should be considered:

- (a) if people working under the control and direction of others are treated as self-employed for tax and social insurance purposes, they may nevertheless be treated as their employees for health and safety purposes;

- (b) it may be necessary, therefore, to take appropriate action to protect them. If any doubt exists about who is responsible for the health and safety of a worker, this should be clarified and included in the terms of a contract prior to the commencement of the work.

However, a legal duty under the Act cannot be passed on by the means of a contract and there will still be duties towards others under Section 7 and 8 of the 1989 Act. If such workers are employed on the basis that they are responsible for their own health and safety, legal advice should be sought before doing so.

2.5 Duties on employees

Without prejudice to the requirements of Section 9 of the Act and Regulation 14 of the General Application Regulations, 1993, the main duties on employees under the Chemical Agents Regulations are to:

- (a) co-operate with their employers so far as this is necessary to enable employers to meet their obligations under these Regulations e.g. by following established procedures which minimise the risk of exposure;
- (b) make full and proper use of control measures including personal protective equipment and report defects;
- (c) ensure that equipment is returned after use to any storage place the employer provides for it, and to report immediately to the employer, i.e. the "foreman", supervisor or safety representative, as appropriate, any defects discovered in the equipment;
- (d) attend, where appropriate, health surveillance at the appointed time and give the appointed occupational healthcare professional information about their health that may reasonably be required;
- (e) report any accident or incident which may have resulted in the release into the workplace of a dangerous chemical or substance.

CHAPTER 3

DETERMINATION AND ASSESSMENT OF THE RISK OF HAZARDOUS CHEMICAL AGENTS

(Regulation 4)

Introduction

This chapter deals specifically with the information necessary in order to perform a risk assessment (including where this information can be obtained), who is responsible and who should perform the risk assessment and all aspects related to the development of an adequate risk assessment, taking into account any changes and revision that may arise or become necessary.

The purpose of a risk assessment is to enable the employer to make a valid decision about the measures necessary to prevent or control the exposure of his or her employees to chemical agents, or hazardous chemical agents, arising from the work activity. It also enables the employer to demonstrate readily, both to themselves and to others who may have an interest, e.g. safety representatives, the Authority's inspectors, etc. that he or she has:

- (a) considered all the factors pertinent to the work;
- (b) reached an informed and valid judgement about the risks;
- (c) considered the practicability of preventing exposure to hazardous chemical agents;
- (d) considered the steps which need to be taken to achieve and maintain control of exposure where prevention is not reasonably practicable in accordance with Regulations 5 and 6;
- (e) considered the need for monitoring exposure at the workplace and for health surveillance; and
- (f) identified other action necessary to comply with the Regulations.

The risk assessment can be made as part of, or as an extension of, the more general risk assessment duties placed on employers by Section 12 of the 1989, Act and Regulation 10 of the General Application Regulations, 1993. A risk assessment must be available for all hazardous chemical agents and must be carried out before any new activity involving hazardous chemical agents takes place.

3.1 The work involved in making a risk assessment

The amount of work involved in carrying out a risk assessment will vary and will depend on the extent to which:

- (a) the level of exposure is already known through previous assessment and the type of risk previously identified;

- (b) the conclusions reached about the adequacy of proposed or existing controls are immediately obvious based on known information from the supplier;
- (c) there is existing knowledge gained from previous experience;
- (d) any existing records are still valid. These will include records about:
 - (i) the type of substance involved;
 - (ii) the numbers and categories of employees potentially exposed;
 - (iii) their work activities;
 - (iv) the results of previous exposure; and
 - (v) the suitability of existing control methods.

In some circumstances it will only be necessary for employers to read suppliers' information sheets to decide whether their existing practices are sufficient to ensure control of exposure, i.e. the controls in place are to the standard specified and are properly maintained. Accurate and complete information on data sheets is essential when considering workplace controls. If employers or those performing the risk assessment have concerns about the quality and reliability of the information provided on the data sheets received, or if they are unsure of the application of the information to their situation, they should contact the supplier for clarification or for further guidance or information.

In other circumstances, and in particular for new activities, employers may need to consult manufacturers' standards, technical papers, trade literature etc. to estimate the likely exposure before deciding what control measures they should apply.

The process of carrying out a risk assessment is not a bureaucratic exercise or simply the collection of information resulting in mountains of paper to be filed away and forgotten. Collecting manufacturers' or suppliers' data sheets and other information does **not** in itself meet the requirements of the Regulations to carry out a risk assessment. This stage of information gathering from the sources as outlined indicates the initial or first step of the assessment process only. The information thus obtained must then be used and considered with respect to developing the necessary and appropriate controls required to protect the health of those who may be at risk from exposure to the identified hazardous chemical agents at the workplace.

Employers are responsible for carrying out the risk assessment but may need to acquire the services of other persons to do this work. Employers must ensure that whoever carries out the risk assessment and provides advice on the prevention and control of exposure is competent to do so as required by the 1989 Act. This does not necessarily mean that particular qualifications are required. However, whoever carries out the risk assessment should:

- (a) have adequate knowledge, training, experience and expertise in understanding the hazard so as to perform a risk assessment;
- (b) know how the work activity uses or produces chemical agents or hazardous chemical agents;

- (c) be familiar with and understand the requirements of these Regulations and the appropriate Code of Practice;
- (d) have the ability and the authority to collate all the necessary, relevant information; and
- (e) have the knowledge, skills and experience to make the right decisions about the risks and the precautions that are needed.

The employer or person carrying out the risk assessment (on behalf of the employer) may not always have complete familiarity of all aspects of the assessment required by the Regulations. In such situations it may be necessary to engage more than one person to perform the complete risk assessment as required by the Regulations. For example, a supervisor's experience of a particular process could be combined with the technical and legal knowledge of a health and safety manager so that the complete assessment can be made. If more than one person contributes to the risk assessment, the employer should ensure that each person knows precisely what they are to do, and nominate one person to co-ordinate, compile and record the main findings of the risk assessment.

3.2 Identifying chemical agents or hazardous chemical agents for assessment purposes

The person carrying out the risk assessment should determine whether there are any chemical agents or hazardous chemical agents at the workplace in a form which may, because of their physico-chemical, chemical or toxicological properties and the way they are used or are present in the workplace, present a risk to the safety and health of employees or others.

The risk assessment should take into account those substances that are:

- (a) brought into the workplace and handled, stored and used for processing;
- (b) produced or given off, (e.g. as fumes, vapour, dust etc.) by a process or an activity or as a result of an accident or incident;
- (c) used for, or arise from maintenance, cleaning, and repair work;
- (d) produced at the end of any process, e.g. wastes, residues, scrap etc.; or
- (e) produced from activities carried out by another employer's employees in the vicinity.

A risk assessment of the risks created by any work must be comprehensive and cover those items listed in Regulation 4. In particular, it should also include consideration of:

- (a) the substances or types of substance to which employees are liable to be exposed;
- (b) the properties, i.e. physical, chemical or biological of the substances and the effects they can have on the body;
- (c) where those substances are likely to be present and in what form, i.e. whether they are used or produced and in what amounts;
- (d) the level and duration of exposure;

- (e) the ways in which, and the extent to which, any groups of people could be exposed, including maintenance workers, office staff, night cleaners, security guards, members of the public such as visitors, patients etc., taking into account the type of work and process, and any reasonable foreseeable deterioration in, or failure of, any control measure provided;
- (f) the need to protect particular groups of employees who may be at an increased risk: e.g. inexperienced trainees and young persons; pregnant workers; disabled workers; maintenance workers; workers who, for other reasons, may be compromised or vulnerable should exposure to certain chemical agents occur; workers who may work in circumstances where exposure is foreseeably higher than normal; and workers known to be susceptible to certain illnesses such as dermatitis, asthma or other diseases which may be caused by exposure to chemical agents or hazardous chemical agents;
- (g) an estimate of exposure, taking into account any information that may be available about:
 - (i) the concentration likely to be produced by the work concerned;
 - (ii) the effort needed to do the work and how this may affect the rate and volume of air employees breathe – (for some work activities, employees might breathe three or four times the volume of air that they would breathe at rest); and
 - (iii) the effect of any engineering measures and systems of work currently used for controlling potential exposure; and
- (h) how the estimate of exposure compares with any existing, valid standards which represent adequate control, e.g. an Occupational Exposure Limit Value or Biological Limit Value.

Employers should give particular consideration to activities which give rise to, or have the potential to give rise to, the highest exposures e.g. cleaning of equipment, work in confined spaces, or non-routine or end-of-shift tasks. An understanding of the factors that contribute to employees' exposure will help employers decide on the best way to control such exposure.

If comparison with the estimate of exposure ((g) above) shows that control is likely to be inadequate, the risk assessment should also describe the extra steps needed to obtain and maintain adequate control, e.g. better enclosure and extraction etc.

3.2.1 Safety data sheets

Employers making a risk assessment for a substance (or preparation) that is classified under existing European Directives must consider, and take into account, the information the supplier provides on the safety data sheet. These sheets provide users of hazardous chemical agents with some of the information they need to protect the health of employees and for handling the substance safely in the workplace. The safety data sheet contains information under a number of obligatory headings, e.g. "hazard identification", "exposure controls – personal protection", "storage", "first aid", etc., and is a useful source of information in helping employers make the decisions required for the risk assessment.

Accurate, complete and correct information on safety data sheets is essential when considering workplace controls: e.g. over-classification of a substance might lead to unnecessarily stringent controls; under-classification may result in risks to employees' health. If employers have concerns about the quality and reliability of information provided on a data sheet, or if they are unsure of the application of the information to their situation, they should contact the supplier for clarification or for further guidance. Up-to-date safety data sheets must be obtained from the supplier as classification may change as newer information concerning chemical agents comes to light.

Where a chemical agent is produced within a process and there is a risk of exposure to that chemical agent within the plant or premises, the employer must endeavour to find out the hazardous properties of that substance and the control measures necessary to reduce the risk of exposure to as low a level as is reasonably practicable. This could involve the use of knowledge, experience, available data and, if necessary, the carrying out of appropriate tests.

3.2.2 Exposure to two or more substances

Where a work activity may expose employees to more than one hazardous chemical agent, the employer must consider the possible enhanced harmful effects of combined or sequential exposures. If employees are under health surveillance that is being supervised by an occupational healthcare professional, the employer should seek advice from the occupational healthcare professional concerned. Otherwise, information may be available from other sources such as the individual suppliers of the substances, trade associations or guidance material etc.

3.2.3 Using personal protective equipment to secure adequate control of exposure

In deciding what measures are needed to control exposure, employers should only use personal protective equipment (PPE) so far as is reasonably practicable after all other measures have been taken. Employers may use PPE as secondary protection in combination with other control methods such as local exhaust ventilation, if those other control measures do not adequately control exposure by themselves. However, there may be circumstances where an employer considers it prudent to issue personal protective equipment such as clothing, face-shields, gloves etc., not because other control measures are inadequate on their own, but to provide employees with additional protection should any of those measures fail.

3.3 Recording the risk assessment:

All employers must carry out a risk assessment in writing. Employers can use the recorded findings as evidence:

- (a) to show the enforcing authorities that they have carried out risk assessment in accordance with Regulation 4;
- (b) to demonstrate that they have systematically considered all the factors relevant to the work, and put in place measures either to prevent exposure or to achieve and maintain adequate control of exposure; and
- (c) to inform workers regarding the control measures adopted based on the risk assessment.

The significant findings of the risk assessment should represent an effective statement of hazards, risks and actions taken to protect the health and safety of employees and anyone else that may be affected by the work. Employers will need to record sufficient

detail of the risk assessment itself so that they can demonstrate to a safety representative or inspector etc. that they have carried out an adequate risk assessment. The record may refer to and rely on other documents and records describing procedures and safeguards, and these should be cross-referenced in the risk assessment.

The record may be in writing or recorded by other means, e.g. electronically, so long as it is readily accessible and retrievable at any reasonable time for use by employers in reviews or for examination, e.g. by a safety representative or inspector etc.

The amount of information employers should record will be proportionate to the risks posed by the chemical agents present and or the work activity. In the simplest and most obvious of cases where chemical agents or hazardous chemical agents pose little or no risk, e.g. for many of the substances often found in small quantities in offices, the employer need only record:

- (a) the substances to which the employees are or are likely to be exposed and the form in which they occur – liquid, powder, pellets, dust etc.;
- (b) the measures taken under Regulation 5 to adequately control exposure, e.g. taking account of the information provided by the supplier, and using the substances in accordance with their accompanying instructions; and
- (c) a statement that because the substances pose minimal risk, a further detailed risk assessment is deemed to be unnecessary.

Where a number of different chemical agents or hazardous chemical agents pose a minimal risk to the safety and health of employees, the employer may group together, on a single record, the results of the risk assessments for all the individual substances concerned.

However, where the work concerned presents a more significant risk to safety and health, the significant findings of the risk assessment should comprise a more comprehensive record. It should include at least the appropriate items from the following non-exhaustive list:

- (a) the substances to which the employees are liable to be exposed and the form in which they occur, e.g. liquid, gas, vapour, powder;
- (b) the processes or activities in which the substances are used or produced and how employees may be exposed to them, including the quantities stored and used in the workplace;
- (c) the hazards and risks the substances present under normal conditions of use, and in circumstances of an unforeseen incident, accident or emergency which could result in an uncontrolled release of the substance concerned into the workplace;
- (d) the extent to which prevention and substitution of a substance or process was considered (Regulation 5);
- (e) identification of the employees or groups of employees liable to be exposed;
- (f) the preventive measures already in place to achieve adequate control of exposure, including the use of any personal and respiratory protective

equipment (RPE). (These need not duplicate details of measures more fully described in other documents such as standard operating procedures but could refer to them);

- (g) the commissioning, monitoring and testing required as part of the process of validating the effectiveness of, and refining of, control measures;
- (h) whether it is necessary to carry out exposure monitoring and measurement and the frequency with which any further air monitoring will be carried out;
- (i) where appropriate, the reasons for selecting particular types of personal protective equipment including respiratory protective equipment to secure adequate control;
- (j) the conclusions reached on the risks to the health and safety of employees and to any other people who may be affected by the work concerned, taking account of preventive measures already being used;
- (k) whether it is appropriate to place any identified groups of employees under health surveillance (Regulation 10) and, where available, the results of health surveillance already undertaken; and
- (l) when the risk assessment will be reviewed or the period between successive reviews.

This record of the significant findings will also form the basis for a revision of the risk assessment.

The risk assessment must clearly identify the measures that have been taken or that must be put in place in relation to the requirements of the Regulations, including the dates for such actions or measures to be put in place and made operational.

3.3.1 When to record the significant findings

The employer should record the significant findings when the risk assessment is made. In some circumstances, however, it may not be possible to record *all* the significant findings until relevant information becomes available, e.g. exposure monitoring results. In such situations, the employer should complete or update the significant findings as soon as the information becomes available. However, the employer must ensure that while waiting for information to confirm the conclusions drawn from the risk assessment, a cautious approach is adopted to ensure that employees' exposure to chemical agents or hazardous chemical agents is adequately controlled and kept to a minimum so far as is reasonably practicable.

Where the employer, having addressed the requirements of Regulation 4 and found that the chemical agents present pose a minimal risk to safety and health, they may decide that a further detailed risk assessment is unnecessary. In so deciding, the employer should record a justification for this decision together with details of the competent person who performed the assessment.

3.3.2 Reviewing the risk assessment

The record of the risk assessment should be a "living" document, which must be reviewed to ensure that it is kept up to date. The employer should make arrangements to ensure that the risk assessment is reviewed regularly. The date of the first review and

the length of time between successive reviews will depend on the type of risk, the work and the employer's judgement on the likelihood of changes occurring.

The risk assessment must be reviewed immediately:

- (a) when there is evidence to suggest that it may no longer be valid, for example from:
 - (i) the results of examinations and tests of engineering controls (Regulation 6(1)(b));
 - (ii) the results of monitoring exposure (Regulation 6(1)(c));
 - (iii) the results of health surveillance, e.g. the identification of an adverse health effect or a confirmed case of work-related disease (Regulation 10); or new information on health risks;
 - (iv) reports or complaints from supervisors, safety representatives or employees about defects in the systems of work or control systems; or
- (b) where there has been a significant change in the circumstances of work, especially one which may have affected employees' exposure to a hazardous chemical agent such as:
 - (i) a change in the substances used, including the introduction of a substitute substance, or their source;
 - (ii) plant modification, including engineering controls;
 - (iii) a change in a process or method of work which is likely to affect the nature of the hazard, e.g. change in work procedures;
 - (iv) a change in the volume or rate of production; or
 - (v) a reduction in the workforce without any corresponding reduction in the rate of production and the consequential additional pressures on employees.

In the case of a new activity involving hazardous chemical agents, work shall not commence until after an assessment of the risk of that activity has been made and the preventive measures identified in that risk assessment have been fully implemented (e.g. including the possibility of additional training and instructions of workers with respect to the new activity introduced).

Where the risk assessment is changed and control measures are changed or adapted to meet the new circumstances, employers must take action to implement any necessary changes identified by the review and record afresh the significant findings, including the need for additional training and instruction of workers.

When reviewing the risk assessment, employers should use the opportunity to look again at their prevention or control measures. In particular, they should:

- (a) reconsider whether it is practicable to prevent exposure to hazardous chemical agents by changing the process or substituting the hazardous chemical agents for ones which are less hazardous under the particular conditions. This may be possible because of technological developments, or changes in the relationship between costs and substances, equipment used and control measures;
- (b) reconsider whether it is practicable to use a less hazardous form of the same substance (e.g. using granulated raw material rather than powder); and
- (c) re-examine existing control measures to decide whether they can be improved: e.g. for substances which have an Occupational Exposure Limit Value consider whether the controls really reduce exposure as far as is reasonably practicable below the OELV, or merely just below it.

3.3.3 Consulting employees and their representatives

Employers should involve their employees and their safety representatives in the processes of carrying out and reviewing risk assessments. They are in a good position to know what happens in practice and they will use the controls that the employer introduces. Employers must involve their employees as part of their duties under Regulation 9 to provide them with suitable information, training (including instruction as appropriate) and consultation. Employers must also:

- (a) tell employees or their workplace representatives the results of the risk assessment;
- (b) explain how control measures are designed to protect their health from chemical agent(s) or hazardous chemical agent(s); and
- (c) explain how any changes introduced will affect the way the employees do the work in the future.

Employees and their safety representatives or both, must be provided with the results of the risk assessment (including explanation of these results as necessary) and the data used to carry out the risk assessment.

CHAPTER 4

PREVENTION AND CONTROL OF EXPOSURE TO HAZARDOUS CHEMICAL AGENTS

(Regulations 5 and 6)

Introduction

This chapter deals with prevention and control measures to avoid, prevent and control exposure to hazardous chemical agents at the workplace. The layout of the guidance information contained in this chapter is set out in the standard prevention and control sequence, i.e.

- prevention through elimination
- followed by reduction methodologies
- specific methods which can be used where elimination and thus prevention of exposure is not possible

In addition, this chapter sets out guidance relating to Personal Protective Equipment (PPE), including Respiratory Protective Equipment (RPE), information on Occupational Exposure Limit Values (OELVs), and methods to protect against exposure when the route of concern is other than inhalation, e.g. eyes, skin or orally.

An employer's overriding duty, and first priority, is to consider how to prevent employees being exposed to hazardous chemical agents (Regulation 5). Employers who do not first consider this are failing to comply with a fundamental requirement of the Regulations. The duty in Regulation 5(1) in relation to elimination of the risks from hazardous chemical agents should be achieved by measures other than the use of personal protective equipment. Employers can best comply with this requirement by eliminating completely the use or production of hazardous chemical agents in the workplace. This might be achieved by:

- (a) changing the method of work so that the operation giving rise to the exposure is no longer necessary; or
- (b) modifying a process to eliminate the production of a hazardous by-product or waste product; or
- (c) where a hazardous chemical agent is used intentionally, substituting with a non-hazardous chemical agent which presents **a lower risk** to safety and health.

In many workplaces, it will not be possible or practicable to eliminate exposure to hazardous chemical agents completely. Therefore, where it is necessary to use a hazardous chemical agent, an employer should consider whether it is possible to significantly reduce exposure by:

- substituting an alternative substance; or
- using a different form of the same substance; or
- using a different process,

which, in the circumstances of the work, presents less risk to the safety and health of employees. This might be achieved by changing the form of the substance concerned so that exposure is negligible, e.g. using a substance in pellet rather than powder form.

The employer will need to take many factors into account when considering whether to use an alternative substance, including all the harmful properties of any proposed replacement. The ultimate decision should be based on a balance of any new risks it might present against the potential benefits. For example, in seeking a less toxic substitute chemical for a process, the employer's choice of one with lower toxicity but higher flammability might increase the overall risk if the process has an intrinsic fire risk. Therefore, in considering potential substitutes, employers should be aware of the responsibilities they have under the General Application Regulations and any other relevant statutory provisions.

The process of preventing exposure by substitution with a less hazardous chemical agent is a thorough and comprehensive one that should identify suitable alternative substances. It should result in the employer selecting for use the substance that produces the least risk for the circumstances of the work.

4.1 Control of Exposure

Where prevention of exposure to hazardous chemical agents is not reasonably practicable, employers must comply with the secondary duty in Regulation 5(1)(a) to reduce the risk to health and safety to a minimum. To achieve this, employers must first consider, and, where appropriate for the circumstances of the work, apply the measures set out in Regulation 6(1)(a) which are in priority order. This means that employers should apply the measures set out in Regulation 6(1)(a)(i) in so far as they are appropriate, before considering those in Regulation 6(1)(a)(ii) and so on.

Control of exposure should be achieved with measures other than the use of personal protective equipment, which should only be used as a last resort and then in addition to other control measures (Regulation 6(1)(a)(iv)).

It will not always be possible or necessary to apply all the controls in the priority order in which they are listed in Regulation 6(1)(a). The employer's aim should be to select those control measures that in practice will work best to protect the safety and health of employees. For example, many smaller firms who use or produce small quantities of hazardous chemical agents that do not pose a serious risk to the health of employees may be able to achieve adequate control of exposure by carefully controlling the workroom environment. In those circumstances, it may be possible to control exposure by relatively simple steps, e.g. by providing general ventilation or effectively preventing spillages.

In certain circumstances, e.g. maintenance and cleaning operations, employers may also need to provide personal protective equipment, including respiratory protective equipment.

4.2 Specific control measures

Regulation 5(1)(a) provides a list of typical control measures which employers should consider when applying the control measures set out in Regulation 5. The list in Regulation 5(1)(a) is not in any hierarchical or priority order, but employers should apply each measure in every case where the circumstances of the work make it appropriate. The objective is to use the findings of the risk assessment to select the controls that are proportionate to the risk that will achieve adequate control of exposure.

Regulation 5(1)(a)(iv) requires employers to reduce to the minimum for the work concerned the duration and intensity of exposure. For substances which have been assigned an Occupational Exposure Limit Value (OELV), or in-house exposure limit, employers can comply with this requirement by ensuring that exposure complies with the appropriate occupational exposure limit for the substance concerned but exposure should be maintained as low as reasonably practicable below that exposure limit. For substances assigned an OELV, the employer should have regard to the requirements of Regulation 6(1)(d).

The requirement at Regulation 5(1)(a)(vi) – “reducing the quantity of chemicals in the work area to the minimum required for the type of work concerned” – is not intended to prevent employers buying chemical agents or hazardous chemical agents in bulk in order to reduce their costs, but to reduce the overall risk by minimising the amount potentially released into the working area.

The control measures that employers may have to use could be a combination of any or all of the following:

- (a) the design of plant, processes, systems and methods of work, and engineering controls;
- (b) totally enclosed process and handling systems;
- (c) plant or processes or systems of work which:
 - (i) keeps the production or generation of the hazardous chemical agents to a minimum; or
 - (ii) contains chemical agents within the plant;
 - (iii) reduces or eliminates the need for maintenance staff to go into hazardous areas; and
 - (iv) limits the area contaminated if spills and leaks occur;
- (d) ventilation:
 - (i) which can be partial enclosure, with local exhaust ventilation; or
 - (ii) local exhaust ventilation; or
 - (iii) sufficient general dilution ventilation;
- (e) reducing to a minimum the number of workers required to do the work:
 - (i) exclusion of non-essential employees, e.g. by using refuges or segregation;
 - (ii) reducing the level and duration of exposure; and
 - (iii) reducing the quantities of hazardous chemical agents used or produced;
- (f) regular cleaning of contamination from walls, surfaces etc.;

- (g) providing safe storage and disposal of hazardous chemical agents; and
- (h) hygiene measures: (adequate facilities for washing, changing and storage of clothing and PPE, including arrangements for laundering contaminated clothing; separate accommodation for clothing worn to work which may become contaminated by work clothing; where appropriate, prohibiting employees from eating, drinking and smoking in contaminated areas which may result in the ingestion of hazardous chemical agents).

Employers should ensure that whoever provides advice on the prevention or control of exposure is competent to do so in accordance with Section 6(2)(j) of the 1989 Act and Regulation 8(c) of the General Application Regulations 1993. The people who carry out this work should have adequate knowledge, training and expertise, e.g. in the design of processes, ventilation and the selection of personal protective equipment.

For hazardous chemical agents, the employer should make every reasonable effort to achieve adequate control of exposure by measures other than personal protective equipment. PPE should only be used where it is not reasonably practicable to achieve control of exposure by those control measures alone, and then only in addition to them (Regulation 6(1)(a)(iv)).

4.3 When personal protective equipment might be necessary

Regulation 6(1)(a)(iv) requires the employer to provide employees with suitable personal protective equipment, (e.g. respiratory protective equipment, protective clothing, protective gloves, footwear; and equipment to protect the eyes) *in addition to* all other control measures if the combination of all other control measures fails to achieve adequate control of exposure.

The situations where PPE will normally be necessary include:

- (a) where it is not possible to achieve adequate control of exposure by operational or engineering measures alone. In these circumstances, exposure should first be reduced so far as is reasonably practicable by these measures, and then, in addition, suitable PPE should be used to secure adequate control;
- (b) where a new or revised risk assessment shows that PPE is necessary until adequate control is achieved by other measures;
- (c) where there is temporary failure to achieve adequate control of the process, e.g. because of an accident, incident or emergency (Regulation 8), and the only practicable solution to re-impose adequate control in the time available may be the provision and use of suitable PPE; and
- (d) where maintenance operations have to be carried out.

The risk of exposure during these operations should be assessed and appropriate control, such as prior decontamination of equipment and areas, should be identified and carried out. Although exposure may occur regularly during such work, the infrequency and small number of people involved and the difficulties of applying process and engineering controls often makes the use of PPE necessary.

In assessing whether the use of PPE is the appropriate option, employers should consider:

- (a) the limitations of PPE;
- (b) the costs;
- (c) the practical difficulties of ensuring its continued correct use;
- (d) its effectiveness in the actual work situation; and
- (e) the type and level of exposure to the hazardous chemical agents concerned.

4.4 Suitable personal protective equipment

PPE should adequately control exposure to the hazardous chemical agent(s) to which the wearer is exposed, or is liable to be exposed, throughout the time it is used. When selecting PPE, it is important for employers to take into account:

- (a) the circumstances in which it will be used, e.g. the substances to which it will be exposed and for how long;
- (b) whether it can resist penetration by the substance concerned indefinitely or for a specified or recommended period;
- (c) whether the design is adequate and suitable, i.e. the equipment does not dislodge, deform, melt or otherwise fail to perform in the conditions in which it is used;
- (d) the environment in which it will be worn;
- (e) in dusty environments, whether the materials selected reduce the tendency for dust to collect on the PPE and be re-released; and
- (f) ergonomic considerations and the compatibility of different types of PPE to be worn by the employee.

Manufacturers of PPE must ensure that their products comply with Council Directive 89/686/EEC as amended on the approximation of the laws of the Member States of the European Union relating to personal protective equipment.

4.5 Suitable respiratory protective equipment

For each work activity during which it is foreseen that employees will need to wear RPE, the employer should specify the suitable equipment to be worn to make sure that employees are given adequate protection. To be suitable, RPE must be capable of controlling the inhalation exposure as assessed by its manufacturer, e.g. by the equipment's assigned protection factor. The selection and provision of RPE should be based on a range of considerations:

- (a) the standards of protection claimed by manufacturers for different types of RPE, and identification of those types that will provide a greater degree of protection than that required for likely or known exposure;
- (b) the type of work to be done; the physical effort required to do it; the length of time the equipment will have to be worn; the requirements for visibility, comfort and the need for employees to communicate with each other;

- (c) the different physical characteristics of the various workers who need to wear the equipment, e.g. the shape of their faces, to ensure that the equipment fits correctly, and is matched to the wearer, the job and the environment in which it is to be used. Providing an adequate range of suitable equipment will help to ensure that employees have the most comfortable equipment best suited for them and which, as a consequence, is likely to be the most effective in use;
- (d) it must be "CE" marked to show that it is manufactured to meet minimum legal requirements;
- (e) employees should be properly trained in its use and supervised; and
- (f) it should be regularly cleaned and checked to ensure that it remains effective.

4.5.1 Fit testing of face-pieces

The performance of RPE with a tight-fitting face-piece (filtering face-pieces, half and full face masks) depends on a good contact between the wearer's skin and the face seal of the mask. A good face seal can only be achieved if the wearer is clean-shaven and not wearing glasses. The performance of RPE with a loose-fitting face-piece is less dependent on a tight fit on the face, but nevertheless requires the correct size to ensure the wearer achieves an adequate fit.

Employers should ensure that the selected face-piece (tight and loose types) is of the right size and can correctly fit the wearer. For tight fitting types the initial selection should include fit testing. The test will assess the fit by determining the degree of inward leakage of a test agent while the RPE user is wearing the face-piece under test. For other types of face-pieces a suitable and validated qualitative method is equally applicable.

Repeat face-piece fit testing will be needed if a decision is taken to change to a different model of RPE or different sized face piece or if there have been significant changes to the facial characteristics of the wearer. In any case, an annual repeat fit testing would help to confirm the fit.

4.6 Maintenance of control measures

Employers must ensure that any engineering control measure, personal protective equipment or other means or facility provided pursuant to the Regulations is properly maintained and used or applied (Regulation 6(1)(b)). This will require the employer to ensure that adequate inspection, testing and maintenance of plant and equipment occurs. Manufacturers of control equipment and personal protective equipment should specify a frequency of maintenance and testing and this must be observed as a minimum. Records of inspection, testing and examination must be retained to verify maintenance of control measures.

4.7 Measuring levels of exposure

Employers may show that they comply with Occupational Exposure Limit Values by measuring and recording the exposure of employees according to internationally validated procedures. The Health and Safety Executive (UK) have produced a series of validated test methods for the determination of hazardous substances (MDHS series). There are also test methods available from The National Institute for Occupational Safety and Health (NIOSH), USA.

Biological monitoring can also make a valuable contribution to measuring levels of exposure in those situations where air sampling alone may not give a reliable indication of exposure, and is a requirement of these Regulations where a biological limit value is listed (Regulation 10(3)).

4.8 Control for exposure by inhalation

4.8.1 Occupational Exposure Limit Value (OELV)

An OELV is the maximum concentration of an airborne substance averaged over a reference period, to which employees may be exposed under any circumstances. OELVs must not be exceeded and for substances that have been assigned an OELV, employers must reduce exposure so far as is reasonably practicable below the OELV.

OELVs apply only to people at work and to conditions where the atmospheric pressure is normal, i.e. between 900 and 1100 millibars (90-110 Kpa).

OELVs are approved by the National Authority for Occupational Safety and Health and refer to concentrations of chemical agent(s) in the air that people breathe, averaged over a specified period of time, referred to as time weighted average (TWA). Two time periods are used: long-term (eight hours); and short-term (15 minutes).

The Authority revises and publishes a list of OELVs every two years titled, *Code of Practice for the Safety, Health and Welfare at Work (Chemical Agents) Regulations*. Schedule 1 of that Code of Practice sets out the agreed OELVs, while Schedule 3 indicates those chemicals for which it is the intention of the Authority to introduce or change an existing OELV within the next two-year time-frame.

4.8.2 Substances assigned an Occupational Exposure Limit Value (OELV)

The employer should ensure that exposure to hazardous chemical agent(s) is reduced to as low a level as is reasonably practicable below the OELV. For substances with an eight-hour long-term reference period, employers will normally have to carry out a programme of air monitoring in accordance with Regulation 6(1)(c), unless the risk assessment made under Regulation 4 shows that the level of exposure is unlikely ever to exceed the OELV. The extent to which employers can reduce exposure below the OELV will depend on the type of risk presented by the substance, weighed against the cost and the effort involved in taking measures to reduce the risk.

4.8.3 Short-term exposure limits (STELs)

Some substances for which OELVs have been approved have been assigned short-term exposure limits (STELs) (15-minute reference period). These substances can cause acute health effects and the purpose of the short-term limit is to prevent adverse health effects occurring from brief exposures to the substance. For this reason, and in keeping with the principles of adequate control as they apply to OELVs, short-term OELVs should never be exceeded.

4.8.4 Inhaled substances not assigned OELVs

The absence of a substance from the lists of OELVs does not mean that it is safe. For these substances, employers should control exposure to a level to which nearly all the working population could be exposed, day after day at work, without adverse effects on health. As part of their risk assessment(s), employers should decide their own working practices, and set their own in-house exposure standards for controlling exposure to these substances. To be able to do this, they will need to obtain as much information as possible about the substance concerned from a number of sources, including:

- (a) manufacturers and suppliers of the substance;
- (b) industry association publications;
- (c) occupational hygiene and medical journals, and
- (d) other recognised international bodies, associations or agencies.

Employers may also have to set their own in-house exposure limit in situations where a substance they are using has an OELV, but it is not appropriate to apply it, e.g. it is being used in circumstances above normal atmospheric pressure.

4.9 Action if an Occupational Exposure Limit Value is exceeded

The employer's first step should be to consider if there is a visible, obvious reason for the result(s) which exceed the limit, e.g. the person to whom the result(s) relates may be subject to higher than normally expected exposure in a job that only that person carries out. If it is an isolated result, or one or two results which marginally exceed the limit, the employer should consider whether they have real significance and indicate a failure to maintain adequate control, or whether they reflect an error in the measurement method.

If the employer concludes that the air monitoring results indicate inadequate control of exposure, the further steps to take should include:

- (a) checking control measures to ensure that they are working as they should and, for exhaust ventilation etc., that it is performing to design specification;
- (b) liaising with managers, safety representatives and employees to establish possible reasons for the rise in the airborne concentration of the substance concerned;
- (c) considering whether it is necessary to provide the employees who may be exposed to the substance concerned with suitable RPE. This would be a temporary measure only until the situation was brought under control and adequate control of exposure was re-established;
- (d) devising and implementing a programme of immediate action to reinforce the control measures where an OELV is exceeded; and
- (e) taking further air samples to confirm the concentration of the substance in the air in order to check that any remedial action to tighten control has been effective.

If the further air monitoring raises doubts as to whether adequate control is being achieved, the employer should review the risk assessment to decide whether additional and more stringent controls are needed as required by Regulation 4 (5)(d).

4.10 Adequate control – exposure by routes other than inhalation

The Regulations require that employers prevent or adequately control exposure by all routes, not just the inhalation route and deals with substances that can be hazardous to health and safety by:

- (a) absorption through the skin or mucous membranes; or

- (b) contact with the skin or mucous membranes, e.g. dermatitis; chemical burns;
or
- (c) ingestion.

Some information about substances that can be absorbed into the body is contained in the 2002 Code of Practice for the Safety, Health and Welfare at Work (Chemical Agents) Regulations, 2001. Substances that have been assigned an Occupational Exposure Limit Value and that can be absorbed through the skin are identified with a skin ("Sk") notation. Safety data sheets and hazard warning labels are other useful sources of information about substances that have the potential to affect and be absorbed through the skin.

Exposure to any hazardous chemical agent(s) that can be absorbed by any of the routes listed above should be controlled to a standard where nearly all the population could be exposed repeatedly without adverse health effect. Employers will achieve adequate control when exposure by these other routes does not result in adverse health effects. The following paragraphs provide some guidance on how employers can achieve adequate control of exposure by these other routes of exposure.

4.10.1 Absorption through the skin

In handling any substance which has been assigned a "Sk" notation in the 2002 Code of Practice for the Safety, Health and Welfare at Work (Chemical Agents) Regulations, 2001, employers' controls, work methods and other precautionary measures should prevent the substance coming into contact with the employee's skin. Employers should also prepare a contingency plan to deal with incidents where a substance makes contact with an employee's skin. The plan should draw on any information and advice provided by the supplier on the particular characteristics and properties of the substance and how to deal with spillages etc.

4.10.2 Contact with the skin and eyes

Irritant and corrosive substances such as acids and alkalis can seriously damage the skin and eyes. Therefore, where employers have to use these substances, they should design their systems of work and select their control equipment to minimise the possibility of skin and eyes being exposed. If this is not possible for a particular job, employers may have to provide suitable personal protective equipment, and in these circumstances, pay special attention to how employees wear and use it and how it is maintained.

Some hazardous chemical agents, e.g. solvents, remove the natural oils from the skin so that frequent or prolonged contact may cause dermatitis or more serious skin disorders. When such skin contact is likely to occur, employers should provide employees with suitable impervious gloves and dispose of them when they become contaminated. Employers should also ensure that employees follow good personal hygiene practice, such as thoroughly washing their hands in warm (not hot) water whenever necessary; properly dry hands/skin after washing; encourage them to use moisturising creams after work, and introduce a regular programme of skin inspection.

4.10.3 Ingestion

If employees do not follow a high standard of personal hygiene, or do not handle substances with care, solid materials or powder may get trapped under fingernails or transferred from overalls and clothing onto food. Where substances that are potentially hazardous by ingestion are used, employers should ensure that employees remove any contaminated clothing in the area set aside for this activity, and thoroughly wash their

hands and face and scrub their fingernails before eating, drinking, smoking or applying cosmetics. Employers should stress the importance of employees following good personal hygiene practices and prevent the eating of food etc. in the vicinity of the work area or work activity.

Employers should ensure that the information, instruction and training given to employees in accordance with Regulation 9 covers all aspects of achieving and maintaining adequate control of exposure by all routes.

4.11 Facilities for washing, changing, eating and drinking

These specific requirements and responsibilities on employers are not unique to the Chemical Agents Regulations. Employers must provide certain facilities to:

- (a) ensure that employees meet and maintain a standard of personal hygiene that is consistent with adequate control of exposure;
- (b) avoid the spread of hazardous chemical agents; and
- (c) reduce the risk of ingestion of hazardous chemical agents.

The facilities should include: -

- (a) *Adequate washing facilities.* These should be sited in a convenient location but situated so that they do not themselves become contaminated – the facilities provided should relate to the type and level of exposure as identified in the risk assessment;
- (b) *Changing facilities.* These should be provided when PPE is used or where outdoor clothing could be contaminated by hazardous chemical agents. They should be located and designed to prevent the spread of contamination from protective clothing to personal clothing and from one facility to another. Facilities should be provided for the safe storage of all PPE to prevent contamination and damage to this equipment;
- (c) *Facilities for eating, drinking etc.* Employees should not eat, chew, drink, smoke or apply cosmetics in places that are contaminated by hazardous chemical agents. This will help reduce the risk of employees ingesting hazardous chemical agents. If employers have to prohibit eating, drinking etc. in certain areas, they should set aside an uncontaminated area(s) where these activities can be carried out. These designated areas should be conveniently accessible to the working area and to washing facilities.

Employers should ensure that not only are the hygiene measures provided but also that employees are made aware, through information, instruction and training of why, how and when they must be used. Employers should also ensure, through appropriate supervision, that employees use the facilities in accordance with agreed procedures. Employers will also have duties under the General Application Regulations in respect of these issues.

CHAPTER 5

DUTIES OF EMPLOYEES

(Regulation 7)

5.1 Duties

This chapter deals with the responsibilities that rest with employees. The practical use and application of prevention and control measures by employees is essential if the control measures introduced at a workplace to control exposure to hazardous chemical agents are to work successfully. No matter how good procedures and equipment are, unless those who are provided with the measures and equipment use them properly and fully, control may not always be maintained and the workers concerned and/or their colleagues may be exposed and their health put at risk. In addition, as the workers use the control measures and equipment on a daily basis they are the first people to be aware if difficulties or defects arise. Therefore, workers must report any such occurrences promptly to avoid any increased risk of exposure which could result should there be a delay in the reporting process.

Employees must use the control measures in the way they are intended to be used and in accordance with instructions given regarding use. In particular they must:

- (a) use the control measures provided for materials, plant and processes;
- (b) follow the defined safe systems of work;
- (c) wear PPE provided, including any RPE, correctly and in accordance with the manufacturer's instructions;
- (d) store the PPE, when not in use, in the accommodation provided;
- (e) remove any PPE, which could cause contamination, before eating, drinking or smoking;
- (f) practise a high standard of personal hygiene, and make proper use of the facilities provided for washing, showering or bathing and for eating and drinking;
- (g) report promptly to the appointed person, i.e. foreman, supervisor or safety representative, any defects discovered in any control measure, including defined methods of work, device or facility, or any item of PPE, including RPE; and
- (h) not intentionally misuse or abuse any control measure or PPE supplied.

CHAPTER 6

ARRANGEMENTS TO DEAL WITH ACCIDENTS, INCIDENTS AND EMERGENCIES

(Regulation 8)

Introduction

This chapter outlines what procedures, plans, action, and follow-up action must be in place with respect to the possibility that an accident, incident or emergency could occur at the workplace, which could increase harm to workers and others who might be affected adversely by such an event. It includes information relating to safety drills, warning and communication systems, what information should be made available and to whom that information should be given. In addition, as part of the action plan employers must take into account the need to develop procedures for any vulnerable or disabled staff, visitors or others who may be present during an emergency event, procedures to clean up the site after the event and procedures regarding how to return the site to normal activity safely and promptly. As a necessary part of such emergency planning it is essential that those people with specific tasks to perform are aware of and understand their defined roles, functions and responsibilities in such events.

6.1 General

The requirements of Regulation 8 of the Chemical Agents Regulations are in addition to those contained in Regulation 9 of the General Application Regulations. The latter Regulations impose a number of general duties on all employers to establish procedures to deal with situations involving emergencies. Details of these are described in the *Guidelines to the Safety, Health and Welfare at Work (General Application) Regulations, 1993 (as amended)*.

6.2 Emergency procedures relating to hazardous chemical agents

An accident, incident or emergency, for the purpose of Regulation 8, is any event which causes, or threatens to cause, any employee or others to be exposed to one or more hazardous substance on a scale, or to an extent, well beyond that associated with normal day-to-day activity. For example, any one of the following events may be sufficient to trigger the emergency actions covered by this Regulation:

- (a) any serious process fire which could give rise to a serious risk to health and safety;
- (b) any serious spillage or flood of a corrosive agent liable to make contact with employees' skin;
- (c) any acute process failure that could lead to a sudden release of chemicals e.g. exothermic reaction that results in emission of toxic fume(s);
- (d) any unintentional interaction of chemicals which could give rise to serious risk to health and safety, e.g. through contamination or incorrect storage of incompatible chemical agents; or
- (e) any threatened significant excursion over an OELV, e.g. where the excursion is clearly the result of an unusual, sudden and serious failure of LEV or other controls.

Whether or not an uncontrolled release or a leak or spillage of a hazardous chemical agent should be regarded as an incident for purpose of Regulation 8 will depend on the scale of the release and the substance concerned and its properties. Employers should use their judgement to decide whether the incident can be dealt with under the prevention and control requirements of Regulation 5, or whether it is necessary to invoke emergency arrangements drawn up under the General Application Regulations supported, where appropriate, by those prepared under Regulation 8 of the Chemical Agents Regulations. If employers invoke Regulation 8, they should also decide what action is appropriate to take that is proportionate to the incident, e.g. not all incidents will automatically require the evacuation of the workplace.

In the context of Regulation 8(a)(i), "safety drills" can be any one or more of a number of emergency procedures unique to the circumstances of the particular workplace and incident. It could mean, for example, a complete evacuation of the premises; the action taken by certain personnel in the event of an emergency, such as isolating plant or equipment; the steps taken by nominated personnel to help disabled staff leave the building; or a general fire drill. The drills can be practised separately or simultaneously.

Employers need not extend the scope of their general emergency procedures drawn up under the General Application Regulations if they are satisfied that:

- (a) the quantity and type of hazardous chemical agent(s) at the workplace would create no more than a slight risk because they have a low toxic effect, and exposure to them would not cause any immediate or short-term adverse health effect; and
- (b) existing control measures and emergency arrangements are sufficient to contain and control any risk to health the substances might pose during an emergency, and they are capable of quickly restoring the situation to normal.

If the conditions described above do not apply, employers must extend their emergency procedures as required by Regulation 8 and ensure that they are capable of:

- (a) mitigating the effects of an incident caused by or directly affecting a hazardous chemical agent on employees' health and safety;
- (b) restoring the situation to normal as soon as possible; and
- (c) limiting the extent of risks to health and safety of employees and, so far as is reasonably practicable, the health and safety of anyone else likely to be affected by the incident, e.g. the people living in the neighbourhood.

To deal with situations that could present significantly greater risks, employers should extend their emergency procedures to include details of the following:

- (a) the identity of the relevant hazardous chemical agent(s) present at the workplace, where they are stored, used, processed or produced; and an estimate of the amount in the workplace on an average day;
- (b) the foreseeable types of accidents, incidents or emergencies that might occur involving those hazardous chemical agent(s), and the hazards they could present; e.g. failure of controls, spills, uncontrolled releases of vapours, dusts or fumes into the workplace, accidents with machinery transporting substances in the workplace, leaks and fire. Where such incidents might occur; what effect they might have; the other areas that might be affected by the incident spreading and any possible repercussions that might be caused;

- (c) the special arrangements to deal with an emergency situation not covered by the general procedures; the steps to be taken to mitigate the effects;
- (d) the safety equipment and personal protective equipment to be used in the event of an accident, incident or emergency, where it is stored, who is authorised to use it. Judgements about the type of safety equipment, and personal protective equipment (including respiratory protective equipment) to be used should be made with regard to the level and type of risk, and a worst case estimate of the likely concentration of a hazardous chemical agent and any likely combustion product in the air or other hazards generated in the workplace during the incident;
- (e) first aid facilities sufficient to deal with an incident until the emergency services arrive; where the facilities are located and stored; the likely effects on the workforce of the accident, incident or emergency, e.g. burns, scalds, shock, the effects of smoke inhalation etc. Employers should note that they have duties to provide first aid facilities under the General Application Regulations;
- (f) the role, responsibilities and authority of the people nominated to manage the accident, incident or emergency and those persons with specific duties in the event of an incident, e.g. the people responsible for checking that specific areas have been evacuated, shutting down plant that might otherwise compound the danger, contacting and liaising with the emergency services on their arrival and making sure that they are aware of the hazardous chemical agents that are the cause of, or are affected by, the emergency;
- (g) procedures for employees to follow; who should be informed and how; how they should respond to an incident and what action they should take; the people who have been assigned specific responsibilities and their roles;
- (h) procedures for clearing up and safely disposing of any hazardous chemical agent(s) damaged or "contaminated" during the incident;
- (i) regular safety drills whereby the frequency of practising emergency procedures will depend on the complexity of the layout of the workplace, the activities carried out, the level of risk, the size of the workforce, the amount of hazardous chemical agent(s) involved, the success of each test;
- (j) the special needs of any disabled or otherwise vulnerable employees e.g. assigning other employees to help them leave the workplace in an emergency; and
- (k) the provision of specific and adequate training to those concerned so as to deal successfully with such incidents, including any assigned tasks and responsibilities etc.

The extended procedures should be compiled in consultation with safety representatives, employees and with those people assigned roles and responsibilities during any emergency.

6.3 Suitable warning and communication systems

Employers must provide suitable communication systems for warning employees who are liable to be affected by an accident, incident or emergency involving hazardous chemical agents. The communication system the employer provides will be proportionate to the size of the workplace and workforce, the quantity of hazardous chemical agents in the workplace and the level and type of risk the substances present. The employer may consider it appropriate to provide warning signals for different

purposes, i.e. one type of alarm to warn employees of the need to be prepared to evacuate because an incident is declared and another signaling the immediate need to evacuate the premises. Suitable warning systems might comprise the following or a combination of the following:

- (a) a continuous or intermittent ringing bell, whistle or hooter;
- (b) warning lights;
- (c) intercom or a public address system.

Employers must ensure that all warning systems can be heard or seen, as the case may be, in all parts of the premises, and in particular by employees who may work in noisier areas. Employers should also ensure that they take due account of the special needs of disabled employees.

6.4 Reviewing the emergency procedures

The employer should review, update and replace the emergency procedures in the light of changing circumstances, e.g. a significant increase in the use of a particularly hazardous chemical agent, changes in the workplace activities involving the use of a new hazardous chemical agent, etc.

6.5 Making procedures available to the emergency services

Employers should ensure that copies of their emergency arrangements and procedures are made available to the relevant internal and external accident and emergency services upon request.

6.5.1 Internal emergency services

Internal services include those people assigned specific duties in the event of an accident, incident or emergency, e.g. people charged with closing down processes or activities where safe to do so, or with liaising with the emergency services on their arrival at the workplace; or safety representatives, first aiders etc. Employers should arrange for all the people concerned to be provided with their own copy of the emergency procedures. Copies may be provided on paper or electronically.

Copies of the procedures should be circulated and seen by all employees at least once every six months.

6.5.2 External emergency services

Employers who need to extend their emergency procedures to cover situations involving hazardous chemical agents should consider whether it is necessary to make all branches of the emergency services aware of their arrangements to deal with accidents and incidents. As a minimum requirement, the employer should contact their local emergency services and offer to make available a copy of the emergency procedures for the premises and the collated information on which they are based.

The employer's procedures, including details of the relevant work hazards, hazard identification arrangements and hazardous chemical agents present at the workplace (including plans and layout of plant and work area as appropriate), will help the emergency services to prepare their own response procedures and precautionary measures in the event of an emergency being declared at the employer's workplace. These measures will ensure that they deal with any declared incident effectively and, especially those that may occur outside normal working hours, in a way that presents the minimum risk to their own staff.

If an incident could have serious repercussions on the environment, the employer should consider whether he or she ought to make a copy of the action plan available to the nearest office of the Environmental Protection Agency and/or Local Authority where this is not a legal requirement under existing legislation.

6.6 Records

A record of the procedures may be kept in writing or recorded by other means, e.g. electronically. It must be kept readily accessible and retrievable for examination at any reasonable time, e.g. by a safety representative, inspector, etc.

6.7 Displaying emergency procedures

Where it is appropriate to do so, employers should display the emergency procedures in a prominent position in the workplace for employees to read, e.g. on employee notice-boards. It will be appropriate, for example, where:

- (a) the company is relatively small and employees are encouraged to consult their notice-board(s) frequently for information about the business and its activities; and
- (b) the emergency procedures are reasonably short and simple, can be read easily and quickly and can comfortably fit on the notice-board.

6.8 Employer's actions during an emergency

The specific actions an employer must take if an accident, incident or emergency occurs are set out in Regulation 8. Where the incident involves the uncontrolled release of a hazardous chemical agent into the workplace, the employer must exclude all people not concerned with the emergency action from the area of contamination (Regulation 8(a)(iv)). The employer must ensure that those employees given the task of identifying the source of the release and making repairs, are provided with suitable respiratory protective equipment and protective clothing and are provided with any specialised safety equipment and plant for use while the incident, accident or emergency persists until the situation is restored to normal and that unprotected workers do not remain in the affected area (Regulation 8(a)(v)).

As well as telling employees the cause of the incident and the measures taken, or to be taken, to resolve it, the employer should also ensure that:

- (a) any important lessons learned from it are communicated to the employees and/or their appointed safety representatives; and
- (b) the information is used in any subsequent review of the risk assessment for the process or activity concerned.

When an incident is declared, employers also have a duty to tell, and if necessary evacuate, other people who are present in the workplace and who may be affected by it, e.g. visitors, employees of another employer etc. Employers whose activities involve the presence of certain listed dangerous substances at the workplace also have a duty under the European Communities (Control of Major Accident Hazards Involving Dangerous Substances) Regulations, 2000 (S.I. No. 476 of 2000) to take all measures necessary to prevent major accidents and to limit their consequences to persons and the environment.

CHAPTER 7

INFORMATION, TRAINING AND CONSULTATION

(Regulation 9)

Introduction

This chapter further outlines the range of information required to be given to employees so that they may understand and correctly use all the control measures provided in order to protect themselves and others during the performance of work activities. In addition to the provision and update of information it is essential that adequate training and instruction is provided and available to all concerned. Finally and most importantly, information updates or revisions must be clearly communicated to employees and adequate consultation and communication must take place to ensure the efficient and effective transmission of information to all relevant personnel.

7.1 Information provided to employees

In addition to the list in Regulation 9(1), the information provided to employees and to other people on the premises, should include where appropriate:

- (a) the purpose of health surveillance, the duty of employees to attend for health surveillance and arrangements for employees to have access to their individual health records (Regulation 10(3) and 10(5)(d));
- (b) when to use the hygiene facilities provided and the importance of doing so in accordance with agreed procedures;
- (c) any further relevant information resulting from a review of the risk assessment, why it has been done and how any changes will affect the way employees do the work in the future; and
- (d) any procedures for dealing with accidents, incidents and emergencies prepared in accordance with Regulation 8. Employers should ensure that all employees have the opportunity to read and discuss the procedures with their safety representatives.

If the nature of the workplace and the activity are such that workers may need instant access to this information, it should be set out on notices displayed in the workplace.

The extent of the information, instruction and training will vary with the complexity of the hazards, risks, processes and controls. The risk assessment will identify these but where a substance is being used that is not particularly hazardous and exposure is adequately controlled, basic instructions and training may be all that is required.

Employers have a duty under the General Application Regulations to ensure that the information they provide is comprehensible. Therefore, they should consider all the various ways of providing information, instruction and training and select those most appropriate to their own circumstances. The range of options includes class or group tuition, individual tuition, computer-based training programmes, courses, written instructions (including leaflets), or a combination of these methods. Employers should also decide how much time is needed to provide training, information and instruction

for their employees to comply fully with the detailed requirements of the Regulations. New employees should be provided with proper induction training, which should always cover emergency and evacuation procedures.

7.1.1 Updating information

Providing information, instruction and training is not a one-off exercise but should be provided at regular intervals as appropriate. Information, instruction and training should be reviewed and updated whenever significant changes are made to the type of work carried out or to the work methods used. Significant changes might include the amount of substances used or produced, new control measures, new substances brought into the workplace, automation of certain processes. Further information and training following a review of the risk assessment should cover why the risk assessment was reviewed, any changes to the way the work is to be done and the precautions the employees should take to protect themselves and others.

7.2 Instruction and training

The instruction and training must ensure that people at work in the workplace do not put themselves or others at risk through exposure to hazardous chemical agents. In particular, the instruction must be sufficient and suitable for them to know:

- (a) how and when to use the control measures;
- (b) the defined safe systems of work;
- (c) how to use the personal protective equipment provided (especially respiratory protective equipment), the correct method of removing and refitting gloves and masks, etc.;
- (d) how to determine how long protective gloves should be worn before any liquid contamination is liable to soak through them;
- (e) what cleaning, storage and disposal procedures they should follow, why they are required and when they are to be carried out; e.g. cleaning contaminated PPE with water or a vacuum fitted with a HEPA filter, and not with an airline; the risks of using contaminated PPE; and
- (f) the procedures to be followed in an emergency.

Training should include elements of theory as well as practice. Training in the use and application of control measures and PPE should be carried out in accordance with the recommendations and instructions supplied by the manufacturer.

7.3 Training Records

Employers must keep records of the training given to individual employees or specific groups of named employees. The records will provide a useful checklist for ensuring that employees receive all the necessary training at the appropriate time. The records will also give evidence of providing information, instruction and training in compliance with Section 6(2)(e) of the Safety, Health and Welfare at Work Act, 1989.

7.4 People carrying out work on behalf of the employer

The employer must ensure that the person, or persons, to whom any work is delegated is competent to do it. This may mean having to use the services of consultants and outside experts. If this becomes necessary, the employer will still need to ensure that the

people engaged receive sufficient information about the particular circumstances of the work, including the hazardous chemical agents used or produced and their hazardous properties.

Employers have duties under the General Application Regulations to appoint, where necessary, one or more competent persons to assist them in carrying out the measures needed to comply with safety and health legislation, i.e. where specific expertise or knowledge is not available from internal sources/personnel. Wherever practicable, therefore, suitable employees should be encouraged to have appropriate training, and to gain the knowledge and expertise that will give them the competence to help their employer comply with safety and health requirements.

People carrying out the work required under Regulations 4, 5 and 6 should have adequate knowledge, training and expertise in the risk assessment, evaluation and control of risks arising from exposure to hazardous chemical agents. It is the responsibility of the employer to assess the competence of any consultant or individual retained to carry out risk assessments or other duties in compliance with the Regulations on the employer's behalf.

7.5 Identifying the contents of containers and pipes

Employers have duties under the Safety, Health and Welfare at Work (Signs) Regulations, 1995 (S.I. No. 132 of 1995) to ensure that containers and pipes are clearly labelled or identified as to the nature of their contents and associated hazards. Therefore, in practice, employers will comply to a large extent with the provisions of Regulation 9(3) of the Chemical Agents Regulations, through meeting the requirements of the Signs Regulations 1995. However, other situations may arise where containers and pipes, which are not covered by the Signs Regulations, may need to be labelled in relation to information such as:

- (a) the name(s) of the hazardous chemical agent(s) which the containers and pipes contain;
- (b) the form the hazardous chemical agent(s) takes, e.g. liquid, semi-liquid, sludge, powder, waste mixed with other identified material; and
- (c) the hazards which the hazardous chemical agent(s) could pose if employees were exposed to the contents, e.g. irritation or burns of the skin from spilt liquids.

Generally, employers should ensure that they have suitable procedures in place, which can identify the hazardous contents of containers and pipes at any given time. The identification process may involve reference to working procedures, to operating procedures or to computer models that identify individual plant components by name or number.

Complex plant or batch processing may require components to be used for different hazardous substances over short periods of time. In these circumstances employees will need to be familiar with the plant operations and the sources of information available to them. Whichever identification procedure employers adopt, they must ensure that employees and safety representatives are familiar with any plans, characters, signs, symbols, codes etc. that the identification system or procedures use.

In addition, it is particularly important for repair or maintenance work involving the opening of vessels or breaking into pipework to be carried out under the control of a "permit-to-work" system. For this work, identifying hazardous substances in a container or pipe is one essential element of the risk assessment that must be carried out before the work starts. During maintenance, for example, workers must be aware of the contents of pipes and vessels, especially where their contents change frequently throughout a process. Accordingly, it is vital that employers have an appropriate and adequate system in place for identification purposes so that they can ensure that they can carry out suitable and sufficient assessments of the work involved, including maintenance and repair work.

7.6 Consultation

The employer must make all information available to employees or their representatives in accordance with the General Application Regulations. More detailed guidance is provided in the Guidelines to the Safety, Health and Welfare at Work (General Application) Regulations 1993 (as amended).

CHAPTER 8

HEALTH SURVEILLANCE

(Regulation 10)

Introduction

This chapter outlines the details regarding the need for health surveillance, when it is deemed appropriate, includes information regarding who should perform the health surveillance, and what records should be kept and made available.

8.1 Why perform health Surveillance

Without prejudice to the requirements for health surveillance laid down in the General Application Regulations, the Chemical Agents Regulations provide more detailed and prescriptive requirements and responsibilities regarding the provision and use of health surveillance at the workplace. Under the latter Regulations the specific detail is aimed more at individual workers rather than the broader category, i.e. the workforce in general.

The objective of health surveillance is to:

- (a) protect the health of individual workers by detecting as early as possible adverse changes which may be caused by exposure to hazardous chemical agents;
- (b) help evaluate the measures taken to control exposure; and
- (c) collect, keep up to date and use data and information for determining and evaluating hazards to health.

Health surveillance is defined in the Chemical Agents Regulations as:

"..... the assessment of an individual employee to determine the state of health of that individual, as related to exposure to specific chemical agents at work and includes biological monitoring."

Considering this definition it should be noted that the identified need or requirement for health surveillance arises as an outcome of the risk assessment performed in accordance with Regulation 4. In other words, having performed the risk assessment, it might be concluded that health surveillance should be made available due to a risk to workers' health having been identified. However in so doing it is important to note that the employer must make available health surveillance that is appropriate and performed under the responsibility of an occupational healthcare professional. Also, having performed the risk assessment, the health surveillance should be available to those (individual) workers identified to be at risk from exposure to hazardous chemical agents rather than a generic application of health surveillance throughout the entire workplace because of the risk identified.

8.2 Occupational healthcare professional

The Chemical Agents Regulations define an "Occupational healthcare professional" as:

"..... a registered medical practitioner or other suitably qualified person employed, or otherwise engaged, by an employer to be responsible for health surveillance of employees covered by these Regulations."

An occupational healthcare professional will generally be a doctor or nurse but could also include a physiotherapist, psychologist etc. The healthcare professional should be specifically trained regarding the area of occupational healthcare, including the performance of health surveillance as required.

The Regulations provide that health surveillance should be made available “under the responsibility of an occupational healthcare professional” thus allowing for situations where health surveillance could be carried out by others who are not healthcare professionals but who are supervised by such a professional. Any decisions on the outcome of the health surveillance would be made by the healthcare professional who is ultimately responsible for such decisions. For example, a suitably trained employee (supervisor) might be given the task of inspecting employees’ hands/skin with respect to detection of dermatitis, or, a secretary to the occupational health department might have responsibility for the collection of urine specimens.

8.3 When health surveillance is appropriate

Health surveillance, including medical surveillance, is appropriate for employees when:

- (a) the exposure of an employee to a hazardous chemical agent is such that an identifiable disease or adverse health effect may be related to the exposure,
- (b) there is a reasonable likelihood that the disease or effect may occur under particular conditions of his or her work; and
- (c) there are valid low-risk techniques available to the employees for detecting indications of the disease or the effect.

The judgement(s) that employers make under this Regulation on the likelihood that an identifiable disease, or adverse health effect, will result from, or may be related to, exposure to a chemical agent should take into account:

- (a) the type and extent of exposure; and
- (b) an assessment of current scientific knowledge such as:
 - (i) available epidemiology;
 - (ii) information on human exposure;
 - (iii) human and animal toxicology data; and
 - (iv) extrapolation from information about similar substances or situations.

Valid health surveillance techniques need to be sufficiently sensitive and specific to detect abnormalities related to the type and level of exposure concerned. Those carrying out the health surveillance should know how to interpret data and this may mean having to identify normal values and to set action levels. The aim should be to establish health surveillance procedures that are easy to perform, preferably non-invasive and acceptable to employees. In particular, procedures should be safe, that is low risk to workers, and none should be carried out if there is a risk of an employee’s health being harmed.

Health surveillance procedures may need to be reviewed, modified etc. in the light of new or revised information about the chemical agent, changes in the exposure or concentration, or work conditions etc.

8.4 Made available

The term “*made available*” is used deliberately in the context of health surveillance requirements or duties on employers within the Regulations. In general, the need to have health surveillance will be identified following the performance of a risk assessment (Regulation 4). Having identified the need for performance of health surveillance with respect to an identified health risk to individual employees, the employer is obliged to make such health surveillance (as appropriate) available to those workers concerned.

With reference to Regulation 9, whereby employers should ensure employees are given information etc., in particular relating to the risk assessment, then employers equally should ensure that their employees are informed about the need to have health surveillance should they be identified as being at risk as an outcome of the risk assessment.

Under the requirement to make available health surveillance, employers must ensure that employees are informed as to why health surveillance is of benefit to them and the details relating to what the health surveillance includes. In general, and assuming that the risk and need to perform health surveillance is clearly and sufficiently explained in a manner that can be understood by all, it would be anticipated that employees would agree to have the appropriate health surveillance performed. However, there may, on occasion, be a reason why an employee does not wish to undergo health surveillance and in such cases employers cannot force health surveillance on that employee. Should an employee not wish to undergo health surveillance even though the risk assessment has shown that such health surveillance is necessary, then the employer should consider transferring the employee to other duties where the risk of exposure and, therefore, the risk to his or her health is reduced to such a level that the health surveillance is no longer required, based on risk assessment.

8.5 Mandatory health surveillance

Notwithstanding the above, health surveillance is a mandatory requirement (i.e. compulsory) with respect to any hazardous chemical agents which have been assigned a biological limit value. This currently applies to only one chemical agent – lead and its ionic compounds. In situations where a biological limit value has been assigned and where health surveillance is mandatory for those employees who may be exposed, employers must ensure that those employees are informed of the requirement to undergo health surveillance before being given work whereby they may potentially be exposed to that hazardous chemical agent.

8.6 Health surveillance procedures

There are different procedures that can all be considered as health surveillance. These procedures need not be independent of each other and more than one procedure can be performed to constitute “appropriate” health surveillance based on risk assessment. Also it should be noted that on occasion the results of one procedure may in fact indicate the need to perform another or different procedure in order to adequately fulfil the health surveillance requirement, e.g. the results of biological monitoring could lead to the need to follow-up with other health surveillance.

The range of procedures available include the following (not set down in a hierarchy or order for performance purposes):

- (a) biological monitoring is the measurement and assessment of workplace agents or their metabolites (substances formed when the body converts the chemical) in exposed workers. Measurements are made either on samples of

breath, urine, or blood, or any combination of these. This procedure may be appropriate where it is possible to link the results directly to an adverse health effect, e.g. mercury, cadmium etc.;

- (b) biological effect monitoring is the measurement and assessment of early biological effects in exposed workers caused by absorption of chemicals;
- (c) medical surveillance (under the responsibility of an occupational healthcare professional) may include clinical examinations and measurements of physiological, e.g. lung function testing, and physiological effects of exposure to hazardous chemical agents in the workplace that may show changes or alterations in body function;
- (d) enquiries about symptoms, inspection or examination by a suitably qualified person, i.e. an occupational healthcare professional;
- (e) inspection performed by a person, e.g. a supervisor, suitably trained and working under the responsibility of an occupational healthcare professional;
- (f) review of records and occupational history during and after exposure thus acting as a way of checking the correctness of the assessment of risks to health from exposure and also indicating whether the risk assessment should be reviewed, i.e. in the light of the results obtained from the health surveillance;
- (g) pre-employment medicals (for the purposes of health surveillance) serve to provide a baseline regarding exposure to specific chemicals which may have occurred prior to an employee commencing work. For example, with respect to a new employee who potentially will be exposed to lead (or its ionic compounds) in his or her new job, it is important to know what the average blood lead level for that worker is before he or she starts that work.

When health surveillance involves the procedure of obtaining biological samples, e.g. blood or urine, this procedure must be explained and acceptable to the workers concerned. In addition, it is unethical for an occupational healthcare professional who acquires such a biological specimen to perform additional tests (other than those specified when taking the sample) without the knowledge and consent of the employee concerned.

8.7 Recording results of health surveillance

The results of health surveillance, and particularly any adverse results, should lead to some action that will benefit employees' health. Therefore, having decided on the options and criteria for action which may result from the outcome of health surveillance and before actually starting planned health surveillance (if required based on the risk assessment outcome), the employer must also consider the method of recording, analysing and interpreting the results of health surveillance.

8.7.1 Individual health record

Employers must keep an up-to-date health record for each individual employee who undergoes health surveillance at his place of work. This record must be maintained by the employer, must not contain any medically confidential information and must contain the non-medically confidential results of the health surveillance (supplied and included on the record by the occupational healthcare professional). Each individual health record should include the following details (approved by the Authority):

(a) First name:

Surname:

Gender:

Home address:

Date of birth:

Job title:

Job description:

Start date of present employment:

Previous job location(s) in this employment:

Historical record of other jobs at this place of work that involved the need for health surveillance:

- (b) Conclusions of all health surveillance procedures and dates on which performed and by whom. The conclusions recorded here should relate **only** to the employee's fitness, non-fitness or fitness with specified conditions for work (completed by the occupational healthcare professional). A copy of this certification regarding an individual's fitness to work should also be retained on the Confidential Medical Record for that employee.

While the individual health record must not contain medically confidential information, it should remain confidential between the employer (or others concerned with protecting the employee's safety and health in this employment) and the employee, unless permission is given by the employee for it to be passed on to others.

8.7.2 Confidential Medical Record

This document contains the detailed medical information relating to the individual and constitutes a "medical" record and as such is therefore confidential. It must be retained (and kept secure) by the occupational healthcare professional and may not be disclosed to others, including non-medical colleagues, without the consent of the employee concerned.

This confidential medical record will contain the results of the health surveillance carried out, including any biological monitoring or other available exposure monitoring performed. It shall contain any specified preventive or protective measures necessary with respect to the individual employee. Individual employees may request access to his or her own confidential medical record, i.e. his or her own health surveillance record.

As specified in the Chemical Agents Regulations, the occupational healthcare professional must allow access to this confidential medical record by an Occupational Medical Adviser of the Health and Safety Authority, if requested.

8.7.3 Record of Exposure

Regulation 6(1)(c) of the Chemical Agents Regulations requires employers:

“..... to carry out on a regular basis, and when any change occurs in the conditions which may affect employees’ exposure to hazardous chemical agents, measurements of hazardous chemical agents in accordance with an internationally validated procedure and in particular in relation to any occupational exposure limit values listed in an approved Code of Practice, unless it can be demonstrated that, ... adequate prevention and protection measures have been taken to prevent risk.”

Those measurements could include personal monitoring, air monitoring, information about the date and location of monitoring etc. and any other relevant measurements deemed necessary based on the risk assessment. The results of these monitoring regimes constitute a record of exposure. This exposure record should be maintained by the employer and a copy forwarded to the occupational healthcare professional for retention and inclusion in the confidential medical record.

The collective results (without being able to identify the specific results of individual workers) of this exposure record should be made available to workers or their representatives or both. Each individual worker may have access to his or her own record. The exposure record must also be made available to the Health and Safety Authority, if requested.

8.8 Detection of an adverse health effect or identifiable disease

Where as a result of health surveillance it is revealed that an employee is found to have an adverse health effect or identifiable disease, considered by the occupational healthcare professional or an Occupational Medical Adviser of the Health and Safety Authority to be as a result of exposure at work to a hazardous chemical agent, or that a biological limit value has been exceeded, the occupational healthcare professional or the occupational medical adviser must:

- (a) inform the employee of the result which relates to him or her personally;
- (b) provide him or her with information and advice regarding such health surveillance which he or she should undergo following the end of exposure (relevant with respect to certain carcinogenic agents only); and
- (c) inform the employer of the outcome of the health surveillance.

In addition, where as the result of health surveillance an employee, if found to have an adverse health effect or an identifiable disease which is considered by the occupational healthcare professional or the occupational medical adviser to be as a result of exposure at work to a hazardous chemical agent or that a biological limit value has been exceeded, then the employer must (in consultation with the occupational healthcare professional concerned) consider:

- (a) whether it is necessary to transfer the employee to other work where there is no exposure to the hazardous chemical agents concerned;
- (b) whether a medical examination of the employee concerned should be arranged and, if so, the person who should carry it out;

- (c) if a medical examination is necessary, whether all other employees who have been similarly exposed to the substance concerned as the affected employee should also be medically examined; and
- (d) if necessary the facilities that should be provided and arrangements that should be made.

Taking into account any advice received from the occupational healthcare professional or the occupational medical adviser, the employer must also ensure that the employee who has suffered the adverse health effect or identifiable disease is advised by a suitably qualified person of the:

- (a) arrangements which will be put in place for continuing health surveillance;
- (b) arrangements, if any, to transfer the employee concerned to alternative employment within the workplace; and
- (c) action to be taken to re-assess the workplace controls.

Finally, any adverse health effects or identifiable disease resulting from exposure to a hazardous chemical agent at work should cause the employer to act (without delay) to:

- (i) review the risk assessment made under Regulations 4 of the Chemical Agents Regulations, and
- (ii) review and revise (as necessary) the control measures in place as required under Regulations 5 and 6 of the Regulations, to adequately eliminate or reduce the risk and thus prevent a recurrence of the ill-health effect or disease.

8.9 Disposing of records when a business ceases to trade

When an undertaking (business) ceases to trade the employer must contact the Health and Safety Authority (via its Occupational Medical Adviser) and so ensure that any health records and/or exposure records are made available to the Authority.

CHAPTER 9

PROHIBITIONS AND EXEMPTIONS

(Regulation 11)

This chapter outlines the provisions of the Chemical Agents Regulations as regards prohibitions and exemptions relating to the production, manufacture, or use at work of specified hazardous chemical agents, listed in Schedule 3 to the Regulations. They are as follows:

- (1) The production, manufacture, or use at work of those substances listed in Schedule 3 is prohibited to the extent set out therein.
- (2) Subject to paragraph (2) (a), (b) or (c) below and to any other statutory provisions which apply to the case, the Health and Safety Authority may, by a certificate in writing, and if it is satisfied that the safety and health of persons who are likely to be affected by the exemption will not be prejudiced in consequence of it, exempt any person or any substance or class of substances from all or any of the prohibitions imposed by this Regulation, and any such exemption may be granted subject to conditions and to a limit of time and may be revoked by a certificate in writing at any time.

Such exemptions may be granted:

- (a) for the sole purpose of scientific research and testing, including analysis;
- (b) for work activities intended to eliminate a specific substance present in the form of by-products or waste products; or
- (c) for the production of the hazardous chemical agents covered by paragraph (a) for use as intermediates and for such use;

provided the procedures and measures set out in paragraph (3) are complied with.

- (3) The employer who is applying for a derogation shall take all necessary precautions to protect the safety and health of his employees, and shall submit:
 - (a) a written justification of the reasons for requesting the exemption;
 - (b) information on the quantities of a specific substance to be used in the year of application and thereafter;
 - (c) a description of the activities or the reactions or processes involved, or both;
 - (d) information on the number of employees likely to be involved in the work;
 - (e) information on the precautions to be taken to protect the safety and health of the employees concerned; and
 - (f) information on the technical and organisational measures to be taken to prevent exposure.

- (4) The exposure of workers to the hazardous chemical agents referred to in paragraph (1) shall be prevented, in particular by providing that the production and earliest possible use of any such agent as an intermediate shall take place in a single closed system, from which the chemical agent may be removed only to the extent necessary to monitor the process or service the processing system.

CHAPTER 10

REVOCATIONS

(Regulation12)

The following Regulations were revoked on the coming into operation of the Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001 (S.I. No. 619 of 2001):

- (a) The European Communities (Protection of Workers) (Exposure to Lead) Regulations, 1988 (S.I. No. 219 of 1988);
- (b) The European Communities (Protection of Workers) (Exposure to Chemical, Physical and Biological Agents) Regulations, 1989 (S.I. No. 251 of 1989);
- (c) The Safety, Health and Welfare at Work Act, 1989 (Control of Specific Substances and Activities) Regulations, 1991 (S.I. No. 285 of 1991); and
- (d) The Safety, Health and Welfare at Work (Chemical Agents) Regulations, 1994 (S.I. No. 445 of 1994).

SCHEDULE 1

(Regulation 6)

LIST OF BINDING OCCUPATIONAL EXPOSURE LIMIT VALUES

Name of agent	EINECS ^(a) No.	CAS ^(b) No.	Occupational exposure limit, 8 h ^(c)		Occupational exposure limit value, short-term ^(d)	
			mg/m ³ (e)	ppm ^(f)	mg/m ³	ppm
Inorganic lead and its compounds	—	—	0.15	—	—	—

^(a) EINECS: European Inventory of Existing Commercial Substances

^(b) CAS: Chemical Abstract Service

^(c) Measured or calculated in relation to a reference period of eight hours

^(d) A limit value above which exposure should not occur, and which is related to a 15-minute period unless otherwise specified.

^(e) mg/m³ = milligrams per cubic metre of air at 20°C and 101.3 kPa (760 mm mercury pressure)

^(f) ppm = parts per million by volume in air (ml/m³)

SCHEDULE 2

(Regulation 10)

BINDING BIOLOGICAL LIMIT VALUES AND HEALTH SURVEILLANCE MEASURES *LEAD AND ITS IONIC COMPOUNDS*

Biological monitoring must include measuring the blood-lead level (PbB) using absorption spectrometry or a method giving equivalent results. The binding biological limit value is:

70 µg Pb/100 ml blood

Health surveillance is carried out if:

- a. exposure to a concentration of lead in air is greater than 0.075 mg/m³, calculated as a time-weighted average over 40 hours per week; or
- b. a blood-lead level greater than 40 µg Pb/100 ml blood is measured in individual employees.

SCHEDULE 3

(Regulation 11)

PROHIBITIONS

The production, manufacture or use at work of the chemical agents and activities involving chemical agents set out below are prohibited. The prohibition does not apply if the chemical agent is present in another chemical agent, or as a constituent of waste, provided that its individual concentration therein is less than the limit specified.

(a) Chemical Agents

EINECS No ^(a)	CAS No ^(b)	Name of Agent	Concentration limit for exemption
202-080-4	91-59-8	2 – naphthylamine and its salts	0.1% w / w
202-177-1	92-67-1	4 – aminodiphenyl and its salts	0.1% w / w
202-199-1	92-87-5	Benzidene and its salts	0.1% w / w
202-204-7	92-93-3	4 – nitrodiphenyl	0.1% w / w

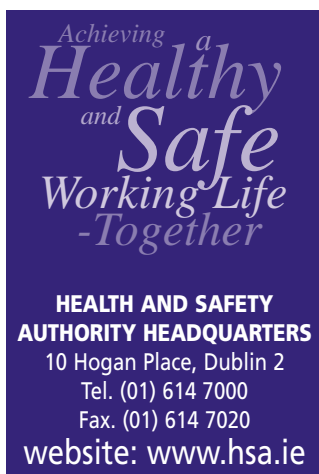
(b) Work Activities

None

^(a) EINECS: European Inventory of Existing Commercial Substances

^(b) CAS: Chemical Abstracts Service

Guidelines to the Safety, Health and Welfare at Work (Chemical Agents) Regulations, 2001



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