NATIONAL CODE OF PRACTICE FOR THE CONTROL OF WORKPLACE HAZARDOUS SUBSTANCES [NOHSC:2007(1994)]

1. TITLE

1.1 This national code of practice may be cited as the *National Code of Practice for the Control of Workplace Hazardous Substances* [NOHSC:2007(1994)].

2. PURPOSE

2.1 This *National Code of Practice for the Control of Workplace Hazardous Substances* [NOHSC:2007(1994)] provides a practical guide on how to comply with the *National Model Regulations for the Control of Workplace Hazardous Substances* [NOHSC:1005(1994)] so as to minimise the risk of disease and injury due to exposure to hazardous substances in the workplace.

3. SCOPE AND APPLICATION

3.1 The national model regulations and national code of practice apply to hazardous substances, as defined in the national model regulations, and extend to all workplaces in which hazardous substances are used or produced and to all persons (consistent with the relevant Commonwealth/State/Territory occupational health and safety legislation) with potential for exposure to hazardous substances in those workplaces.

3.2 There are a limited number of substances listed in the national model regulations which are exempt from the regulations except where their use is related to a work activity. For example:

(a) Food consumed at a workplace is exempt from the national model regulations because its use is not related to the work activity. Food items which are handled, processed or produced at a workplace are covered by the national model regulations, if they meet the definition of a hazardous substance, because their use is related to the work activity of food production.

(b) Skin creams brought into the workplace by employees for their own personal use, for example, moisturising creams, are exempt from the national model regulations because their use is not related to the work activity. Skin creams provided at the workplace for the purpose of decontamination, for example, to remove grease or other chemicals from the skin, are covered by the national model regulations because their use is related to the work activity in which the skin contamination occurs.

3.3 The national model regulations and national code of practice do not apply to radioactive and infectious substances. Radioactive substances are covered by separate legislation to control ionising radiation.

3.4 It should be noted that the National Commission's *National Model Regulations for the Control of Workplace Hazardous Substances* [NOHSC:1005(1994)] establish specific requirements for substances used in the workplace. This in no way derogates from the general responsibilities of employers and suppliers under Commonwealth/State/Territory occupational health and safety legislation. It will also be necessary to ensure compliance with the requirements of dangerous goods legislation for substances which are classified as dangerous goods.

4. DEFINITIONS

4.1 The National Commission's *National Model Regulations for the Control of Workplace Hazardous Substances* [NOHSC:1005(1994)] should be consulted for definitions of terms used in this national code of practice.

5. CONSULTATION

PURPOSE

5.1 Consultation involves the sharing of information and exchange of views between employers, employees and/or employee representatives. Although the responsibility for health and safety decisions rests with the employer, consultation provides the opportunity for employees' experience and suggestions about the use of hazardous substances to be contributed to the decision-making process in resolving health and safety problems.

HOW CONSULTATION SHOULD TAKE PLACE

5.2 Consultation between employers, employees and employee representatives should take place during the implementation of the national model regulations and their subsequent application in the workplace. Employee representatives should have access to all information relating to hazardous substances which is available to employees.

WHAT CONSULTATION SHOULD ADDRESS

5.3 Consultation should address the general implementation of the national model regulations and in particular:

(a) any supply of a new hazardous substance to the workplace;

(b) the assessment of hazardous substances;

(c) how to control hazardous substances;

(d) the requirements for health surveillance, including the choice of medical practitioner; and

(e) the induction and training required.

INFORMATION THAT SHALL BE AVAILABLE

5.4 The following information shall be readily accessible to employees and employee representatives for all hazardous substances present in the workplace:

(a) the register of hazardous substances;

(b) Material Safety Data Sheets (MSDS) compiled in accordance with the National Commission's *National Code of Practice for the Preparation of Material Safety Data Sheets* [NOHSC:2011(1994)][1];

(c) labels on containers compiled in accordance with the National Commission's *National Code of Practice for the Labelling of Workplace Substances* [NOHSC:2012(1994)][2];

(d) reports prepared as a result of workplace assessments;

(e) the results of monitoring;

(f) the results of health surveillance programs, provided that medical confidentiality is maintained; and

(g) any other relevant information.

6. CLASSIFICATION OF HAZARDOUS SUBSTANCES — MANUFACTURERS' AND IMPORTERS' DUTIES

RESPONSIBILITY FOR CLASSIFICATION

6.1 Manufacturers and importers of substances supplied for use at work shall determine whether such substances are hazardous. The National Commission has published two documents which shall be used for this purpose. These are the *List of Designated Hazardous Substances* [NOHSC:10005(1994)][3] and the *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(1994)][4].

6.2 The *List of Designated Hazardous Substances* [NOHSC:10005(1994)][3] is a list of some common hazardous substances. This list is maintained, reviewed and revised regularly by an expert group of the National Commission. The list is intended to be an aid to the classification of substances and should always be checked first by manufacturers and importers. If a pure substance is on the list, it is a hazardous substance for the purpose of the regulations.

6.3 It should be noted that the list is not exhaustive. Therefore, if a particular substance or its ingredients are not listed, the *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(1994)][4] should be applied by the manufacturer or importer. These criteria are the same as those used in the European Community except for the definition of corrosive which is taken from the *Australian Code for the Transport of Dangerous Goods by Road and Rail* (ADG Code)[5]. The criteria are used for determining whether a substance is very toxic, toxic, harmful, irritant, sensitising, carcinogenic, mutagenic, teratogenic or corrosive. The approved criteria also include concentration cut-offs to be applied to determine whether a mixture is hazardous on the basis of the amount of a hazardous ingredient that it contains.

6.4 All hazardous substances supplied for use at work shall have an MSDS, produced by the manufacturer or importer, which indicates that the substance has been determined to be hazardous according to the list and approved criteria of the National Commission.

CLASSIFICATION OF CHEMICAL ENTITIES

6.5 Where a substance consists of a single chemical entity, that is, there is only one ingredient, the substance shall be determined to be hazardous if:

(a) the substance is listed in the *List of Designated Hazardous Substances* [NOHSC:10005(1994)][3]; or

(b) the substance meets any of the health effects criteria in the *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(1994)][4].

CLASSIFICATION OF CHEMICAL MIXTURES AND FORMULATIONS

6.6 Where a substance consists of two or more ingredients, the substance shall be determined to be hazardous if:

(a) the whole substance is listed in the *List of Designated Hazardous Substances* [NOHSC:10005(1994)][3], for example, 'oil of turpentine';

(b) the mixture has been tested as a whole and it satisfies any of the health effects criteria in the *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(1994)][4]; or

(c) any of the ingredients of the mixture:

(i) is included in the *List of Designated Hazardous Substances* [NOHSC:10005(1994)][3], or

(ii) meets any of the health effects criteria,

and is present in the mixture at a concentration which exceeds the relevant cut-off level specified for the hazard classification in the *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(1994)][4]. A mixture may also be hazardous if any of its ingredients meet the health effects criteria but are not present at a level that exceeds the relevant concentration cut-off level. The *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(1994)][4] provides formulae for considering the additive effects of such ingredients.

IDENTIFICATION OF HAZARDOUS SUBSTANCES USED IN THE WORKPLACE

6.7 Employers who are not manufacturers or importers are not required to apply the *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(1994)][4]. They should identify hazardous substances in the workplace by reference to the MSDS or label for the hazardous substance supplied. If required, the employer could also reference the *List of Designated Hazardous Substances* [NOHSC:10005(1994)][3].

7. PROVISION OF INFORMATION—SUPPLIERS' DUTIES

MATERIAL SAFETY DATA SHEETS

7.1 The purpose of MSDS is to provide the information needed to allow the safe handling of hazardous substances used at work. The MSDS for a substance describes its identity, relevant health hazard information, precautions for use and safe handling information.

Production of Material Safety Data Sheets

7.2 Manufacturers and importers shall produce MSDS for all hazardous substances which they supply. The *National Code of Practice for the Preparation of Material Safety Data Sheets* [NOHSC: 2012 (1994)][1] provides practical guidance on meeting the requirements for MSDS under the national model regulations and advises on acceptable formats. Acceptable MSDS formats include those of the National Commission, the European Community and the International Labour Office, as described in the national code of practice. Any overseas MSDS provided in Australia should include the relevant Australian information, for example, supplier contact details and any relevant exposure standard.

7.3 Articles which give rise to hazardous substances during their use, for example, welding rods, should also be accompanied by MSDS or other equivalent information.

Provision of Material Safety Data Sheets on First Supply

7.4 A current MSDS shall be provided by the supplier, on or before the first occasion that a hazardous substance is supplied, to each person who purchases the hazardous substance from the supplier. There is no need to include a MSDS with every delivery. However, when the MSDS has been revised, a copy of the revised MSDS will need to be sent out to each purchaser of the substance.

7.5 Suppliers are not required to provide a MSDS on the first supply to retailers and retail warehouse operators for consumer packages which are intended for retail sale, will not be opened on their premises and hold less than 30 kilograms or 30 litres. However, a MSDS shall be provided on request (***see*** section 7.6 of this national code of practice).

Provision of MSDS on Request

7.6 Suppliers shall provide MSDS on request to purchasers and to prospective purchasers.

Provision of MSDS õ Purchases from Retailers

7.7 Retailers are not included in the definition of 'supplier' in the national model regulations and are therefore not required to provide MSDS to people who purchase workplace hazardous substances from retail outlets. However, retailers may choose to act by arrangement with suppliers to distribute MSDS. This would be particularly appropriate for trade sale outlets.

7.8 Where a person purchases a hazardous substance for use at work from a retailer and the MSDS is not available, the purchaser can obtain, on request, a copy of the MSDS from an upstream supplier, for example, the manufacturer or importer (***see*** section 7.6 of this national code of practice).

Australian National Material Safety Data Sheet Repository

7.9 Manufacturers and importers shall send a copy of each MSDS they produce to the Australian National Material Safety Data Sheet Repository, maintained by Worksafe Australia.

LABELS

Purpose

7.10 The purpose of labelling is to ensure that the contents of a container can be readily identified by product name, and to draw the attention of a person who is handling or using a hazardous substance to the significant hazards involved.

Labelling of Substances

7.11 Suppliers are responsible for the correct labelling of hazardous substances which they supply to others.

7.12 Minimum standards on the labelling of workplace hazardous substances are given in the National Commission's *National Code of Practice for the Labelling of Workplace Substances* [NOHSC:2012(1994)][2].

7.13 Some products when labelled in accordance with other legislation, for example, the *Agricultural and Veterinary Chemicals Act 1988* (Cwlth), are regarded as being appropriately labelled under the National Commission's *National Code of Practice for the Labelling of Workplace Substances* [NOHSC:2012(1994)][2] and separate labelling is not required.

7.14 Hazardous substances imported into Australia, and not otherwise required to be labelled in accordance with any of the dangerous goods transportation codes, such as the ADG Code[5], do not have to be labelled until such time as the importer has taken possession of them.

Labelling of Articles

7.15 Articles which give rise to hazardous substances during their use, for example, welding rods, shall also be appropriately labelled indicating the conditions of use that can lead to the generation of hazardous substances.

OTHER RELEVANT INFORMATION

7.16 Suppliers are responsible for providing, on request, any further information that they may have regarding the safe use of hazardous substances they supply. This information shall include summary reports produced under the *Industrial Chemicals (Notification and Assessment) Act 1989* (Cwlth)[6], where available, and any other relevant information, for example, conditions for safe use.

8. PROVISION OF INFORMATION—EMPLOYERS' DUTIES

MATERIAL SAFETY DATA SHEETS

Purpose

8.1 MSDS provide the information needed to allow the safe handling of hazardous substances used at work. Employers shall ensure that all employees have ready access to MSDS. Employers should encourage employees to read MSDS for those hazardous substances which they may be exposed to in their work.

Obtaining Material Safety Data Sheets

8.2 A MSDS shall accompany the first supply of the hazardous substance (subject to sections 7.5 and 7.7 of this national code of practice). Where an MSDS has not been provided, it may be requested from the manufacturer/importer. The MSDS of a hazardous substance will allow assessment of the use of the hazardous substance and any necessary controls to be established in the workplace.

If the Employer is an Importer

8.3 Where an employer imports a hazardous substance to be used in the workplace, a MSDS set out in accordance with the National Commission's *National Code of Practice for the Preparation of Material Safety Data Sheets* [NOHSC:2011(1994)][1] may not be immediately available. Where an overseas MSDS does not meet the standard described in the National Commission's national code of practice, the employer may, after consultation with employees and employee representatives, arrange for the overseas MSDS to be made available as an interim measure, pending the production by the employer of an appropriate MSDS.

If the Employer is a Manufacturer

8.4 Where the employer manufactures a hazardous substance, the employer shall produce a MSDS for that hazardous substance if it is to be supplied outside the workplace. It is not necessary to produce a MSDS for hazardous substances which are produced and used within the workplace, or for by-products, wastes or fugitive emissions.

Access to Material Safety Data Sheets

8.5 At each workplace, employees and employee representatives shall have ready access to MSDS for the hazardous substances used. Copies shall be readily accessible to employees who are required to use or handle the hazardous substance, as well as to employees who are supervising others working with the hazardous substance.

8.6 Access to MSDS may be provided in a number of ways including:

(a) paper copy collections of MSDS;

(b) microfiche copy collections of MSDS with microfiche readers open to use by all employees; and

(c) computerised MSDS databases.

8.7 Depending on the needs of the workplace, any of the methods in section 8.6 of this national code of practice may be used. In each case, the employer should ensure that:

(a) the current MSDS are available;

(b) any storage or retrieval equipment is kept in good working order;

(c) employees are trained in how to access the information; and

(d) where information is displayed on a screen, there are means of obtaining a paper copy of that information.

Alteration of Material Safety Data Sheets

8.8 MSDS obtained from a supplier shall not be altered except where the MSDS is provided from overseas and is not available in one of the acceptable formats described in the National Commission's *National Code of Practice for the Preparation of Material Safety Data Sheets* [NOHSC:2011(1994)][1]. If an employer wishes to add additional information to the supplier's MSDS, it should be appended to the MSDS. However, it shall be clearly marked to indicate that the appended information is not part of the original MSDS. Specific workplace information may be added in this manner and is not considered to be an alteration to the MSDS.

Material Safety Data Sheet Requirements in Laboratories

8.9 MSDS shall be provided by suppliers of hazardous laboratory reagents. MSDS are not required for subsequent preparations, laboratory samples or reaction intermediates.

If the Employer is a Retailer or Retail Warehouse Operator

8.10 Retailers and retail warehouse operators, in their capacity as employers, are exempt from the MSDS provisions of the national model regulations for goods intended for retail sale. The exemption applies to consumer packages held on their premises, which hold less than 30 kilograms or 30 litres and which are handled in an unopened state.

LABELS

8.11 All containers of hazardous substances supplied to, used in or handled in the workplace shall be appropriately labelled to allow the substances to be used safely.

8.12 Containers of hazardous substances should be labelled in accordance with the National Commission's *National Code of Practice for the Labelling of Workplace Substances* [NOHSC:2012(1994)][2].

Labelling of Decanted Substances

8.13 Where a substance is decanted at work, the type of labelling required will depend on whether the substance is consumed immediately or over a longer period of time.

8.14 Where a decanted substance is not consumed immediately, the employer shall ensure that the container into which the substance is decanted is labelled with the product name and the risk and safety phrases in accordance with the National Commission's *National Code of Practice for the Labelling of Workplace Substances* [NOHSC:2012(1994)][2].

8.15 Where labelling is required but the container into which the substance is decanted is very small, for example, a laboratory test tube, the label may be attached to supporting apparatus, such as a test tube rack. Alternatively, a tag may be used to enable the required information to be provided.

8.16 Where a decanted substance is consumed immediately, no labelling is required provided that the container is cleaned so that it no longer contains the substance.

Unlabelled Containers

8.17 If an employer finds a container that does not have a label or is improperly labelled, action should be taken to correctly label the container in accordance with the requirements of the National Commission's *National Code of Practice for the Labelling of Workplace Substances* [NOHSC:2012(1994)][2].

8.18 If the contents of the container are not known, this should be clearly marked on the container, for example, 'Caution do not use: unknown substance'. Such a container should be stored in isolation until its contents can be identified and, if hazardous, the container is appropriately labelled. If the contents cannot be identified, they should be disposed of in an acceptable manner in consultation with the relevant waste management authority.

8.19 If an employee finds a container that does not have a label, the employer should be advised immediately.

REGISTERS

8.20 A register provides a listing of all hazardous substances which are used or produced in the workplace. Employers and employees should use the register as a source of information and as a tool to manage substances used at work.

Minimum Information Needed in a Register

8.21 The minimum information which shall be included in a register is a list of all hazardous substances used or produced at the workplace and the MSDS for all hazardous substances as required by the national model regulations. The completion of simple and obvious assessments should also be noted in the register (***see*** section 11.15 of this national code of practice).

Keeping the Register Up to Date

8.22 A register shall contain entries for all hazardous substances currently used or produced in the workplace. The register should be updated as new hazardous substances are introduced to the workplace and the use or production of existing hazardous substances is discontinued.

Access to the Register

8.23 Employees with potential for exposure to hazardous substances, employee representatives, emergency services and relevant public authorities shall have ready access to the register. The register can either be centrally located or kept in the workplace to which it pertains.

If the Employer is a Retailer or Retail Warehouse Operator

8.24 Retailers and retail warehouse operators are exempt from the register provisions of the national model regulations for goods intended for retail sale. The exemption applies to consumer packages held on their premises, which hold less than 30 kilograms or 30 litres and which are handled in an unopened state.

OTHER RELEVANT INFORMATION

Identification of Hazardous Substances in Enclosed Systems

8.25 Where a hazardous substance in a workplace is contained in an enclosed system, such as a pipe or piping system, or a process or reactor vessel, it shall be identified to persons who may be exposed to the contents.

8.26 Suitable means of identification include colour coding in accordance with Australian Standard AS 1319 *Safety Signs for the Occupational Environment*[7] or Australian Standard AS 1345 *Identification of the Contents of Piping, Conduits and Ducts*[8]. Such identification should be used in conjunction with suitable work practices including permit to work systems for enclosed systems and confined spaces.

Information About Hazardous Substances

8.27 Employers should make other relevant information regarding hazardous substances available to employees and employee representatives. This will be necessary for hazardous substances produced in the workplace for which a MSDS is not available. Information should be obtained about health effects, precautions for use and safe handling.

Information About Equipment Used With Hazardous Substances

8.28 Employers should provide relevant information to employees and employee representatives on equipment used with a hazardous substance, for example, exhaust ventilation systems. The employer should make the following information available:

(a) the use for which the equipment is designed and the conditions necessary for its safe use; and

(b) results of relevant tests which may have been carried out in connection with the safe operation of such equipment.

NICNAS Summary Reports

8.29 Where they exist and are applicable to the workplace, summary reports produced under the *Industrial Chemicals (Notification and Assessment) Act 1989* (Cwlth)[6] should be made available on request to employees and employee representatives.

Placarding of Tanks and Bulk Stores

8.30 Tanks and bulk stores are excluded from the definition of 'container' in the national model regulations and do not require labelling. However, Commonwealth/State/Territory dangerous goods legislation should be checked as separate placarding requirements may apply to tanks and bulk stores.

9. PROHIBITION OF SCHEDULED SUBSTANCES FOR SPECIFIED PURPOSES

9.1 Certain uses of some hazardous substances are prohibited by the national model regulations. These prohibitions are detailed at Schedule 2 to the national model regulations.

9.2 The employer has an obligation to ensure that these hazardous substances are not used for any purpose specified at Schedule 2 to the national model regulations unless an exemption has been granted by the relevant public authority.

10. INDUCTION AND TRAINING

EMPLOYER RESPONSIBILITIES

10.1 Employers have the responsibility to induct and train employees with potential for exposure to hazardous substances. The training provided shall be commensurate with the associated risks as identified in the assessment process.

THOSE EMPLOYEES NEEDING INDUCTION AND TRAINING

10.2 Induction and training shall be provided to:

(a) those employees whose work potentially exposes them to hazardous substances; and

(b) those employees who are supervising others using hazardous substances at work.

ELEMENTS OF AN INDUCTION AND TRAINING PROGRAM

10.3 An induction and training program should incorporate the following elements:

(a) the labelling of containers of hazardous substances, the information that each part of the label provides and why the information is being provided;

(b) the availability of MSDS for hazardous substances, how to access the MSDS and the information that each part of the MSDS provides;

(c) information about hazardous substances to which employees are or may be exposed in the course of their work (information should include the nature of the hazards, risks to health arising from exposure, the degree of exposure and routes of entry of the hazardous substances into the body);

(d) the assessment process and how the employee can contribute;

(e) the work practices and procedures to be followed in the use, handling, processing, storage, transportation, cleaning up and disposal of hazardous substances;

(f) the measures used to control exposure to hazardous substances, including any information that the employee requires for the correct use and maintenance of control measures;

(g) the proper use and fitting of personal protective equipment;

(h) the procedures to be followed in case of an emergency involving hazardous substances, including any special decontamination procedures to be followed;

(i) first aid and incident reporting procedures to be followed in case of injury or illness;

(j) the nature of, and reasons for, any monitoring required and access to the results of monitoring;

(k) the nature of, and reasons for, any health surveillance required in order to detect the effects of exposure to a hazardous substance;

(l) employees' rights to be advised of the intention to use a new hazardous substance where they are likely to be exposed in the course of their work and the right to be consulted in the process of assessment of a hazardous substance;

(m) employees' rights and obligations in relation to health surveillance; and

(n) suppliers', employers' and employees' duties under the national model regulations.

10.4 The amount of detail and extent of training required will depend on the nature of the hazard associated with the work activity and the complexity of the work procedures and control measures required to minimise the risk of exposure. In this regard, the assessment process provides important guidance.

TRAINING METHODS

10.5 In general, induction and training programs should be designed to draw on and build on employees' current knowledge and previous experience. Language and literacy factors should be taken into account in determining the most suitable training methods. If the literacy level is low, then verbal methods or visual methods should be used. If the employees are of a non-English speaking background, training should be provided in the languages used by the employees in the workplace. The training provided should be practical and, where this is relevant, include hands-on sessions, for example, on the proper use and fitting of personal protective equipment and routine and emergency procedures.

10.6 Training should be evaluated to ensure that employees have an adequate understanding of the matters covered.

REVIEW OF INDUCTION AND TRAINING

10.7 Employers should review their induction, refresher and other training programs each time there is a change in the hazard information available, work practices or control measures in order to ensure that employees are aware of significant changes.

RECORDS OF INDUCTION AND TRAINING

10.8 The employer shall keep a record of the induction and training programs provided. Records should include:

(a) the names of employees receiving training and the dates of attendance;

(b) an outline of the course content; and

(c) the names of persons providing the induction and training programs.

10.9 Records of induction and training shall be kept by the employer for at least five years from the date of the last entry in them.

11. ASSESSMENT

PURPOSE OF ASSESSMENT

11.1 The purpose of the assessment is to enable decisions to be made about appropriate control measures, induction and training, monitoring and health surveillance as may be required by the national model regulations.

11.2 The assessment process enables a distinction to be made between 'hazard' and 'risk'. If a substance is hazardous it has the potential to be harmful to health. The risk is the likelihood that harm will be caused in the actual circumstances of use of the substance.

11.3 Decisions about appropriate action to protect employees (by the measures described in section 11.1 of this national code of practice) will depend on the degree of risk to health that arises from the use of hazardous substances in particular work.

THE ASSESSMENT DUTY

11.4 The employer has the responsibility to ensure that a suitable and sufficient assessment is made of any work involving potential exposure to any hazardous substance.

11.5 It is only necessary to assess work where there is potential for exposure. For example, work involving the handling of unopened containers of hazardous substances would not need to be assessed if those containers are unlikely to be opened or damaged. However, if those containers are opened or damaged so that exposure to the contents might occur, an assessment would be required.

11.6 The assessment focuses on work situations rather than individual substances. A practical way to carry out assessments in a workplace would be to divide the work up into jobs or tasks and assess the risks involved in each of these.

WHAT IS INVOLVED IN THE ASSESSMENT

11.7 There are three steps which shall be included in any suitable and sufficient assessment.

Identification of Hazardous Substances

11.8 The first step is to identify all hazardous substances used or produced in the work being assessed. This should be done as follows:

(a) For substances supplied to the workplace, the label and MSDS for each hazardous substance should be checked to establish whether it has been determined to be hazardous according to the National Commission's *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(1994)][4]. If there is any doubt about whether the substance is hazardous, further information should be requested from the supplier.

(b) If the substance was produced in the workplace and does not have a MSDS, the National Commission's *List of Designated Hazardous Substances* [NOHSC:10005(1994)][3] should be checked.

11.9 Any substance determined to be hazardous by the supplier (as indicated on the label or MSDS), and any substance listed in the *List of Designated Hazardous Substances* [NOHSC:10005(1994)][3], shall be considered in the assessment process.

Review of Information About Hazardous Substances

11.10 The second step is to review the MSDS to check on the health hazard information, precautions for use and safe handling information. If there is no MSDS or the MSDS cannot be practicably obtained, equivalent information should be obtained in each of these areas. The use of equivalent information should be limited to situations where:

(a) the hazardous substance is produced in the workplace and not supplied outside, and the MSDS does not exist; or

(b) the assessment is being undertaken in unusual circumstances, such as away from the usual place of work, and work must proceed.

11.11 Some products, for example, hazardous substances in retail packages, may have sufficient information on a consumer package label to address the likely situations of exposure which would include spillage and disposal of this material.

Identification of Risks

11.12 The third step is risk identification. The risk to health will depend on the hazardous substances used or produced in the work, the nature and severity of the potential health effects and the degree of exposure that occurs. For example, the risk will be greater if a person has significant exposure to substances which have serious health effects.

11.13 To identify the risk of exposure, the particular work should be inspected to establish how people might be exposed, the level of exposure and the adequacy of control.

SIMPLE AND OBVIOUS ASSESSMENTS

11.14 If the inspection of the work shows that any risk can be, or is already, controlled in accordance with the MSDS (or the equivalent information about precautions for use and safe handling), then the assessment is complete and no further assessment is needed.

11.15 For these simple and obvious assessments, the completion of the assessment shall be noted in the register. No further report or record is required.

DETAILED ASSESSMENTS

11.16 For some work a more detailed assessment may be required. These situations include those where:

(a) there is uncertainty about the degree of risk;

(b) there is a significant risk to health, for example, exposure to a hazardous substance may be high and/or the nature of the health hazard is serious; or

(c) more complex chemical processes and/or exposures are involved.

11.17 A more detailed assessment might involve obtaining additional information about health hazards, a thorough evaluation of the work to determine exposures (including monitoring where appropriate), and examination or testing of existing control measures.

ACTION ARISING FROM THE ASSESSMENT

11.18 Where the assessment indicates that there is a significant risk to health, further decisions will be needed to:

(a) select appropriate measures to achieve and sustain control;

(b) ensure that those control measures are properly used and maintained;

(c) arrange induction and training; and

(d) determine if monitoring or health surveillance are required.

11.19 Chapters 10, 12, 13 and 14 of this national code of practice explain the requirements for induction and training, exposure control, monitoring and health surveillance.

GENERIC ASSESSMENTS

11.20 Often a particular hazardous substance(s) is used in the same or similar circumstances in a number of different workplaces or work areas within the one workplace. In such situations, the nature of the hazard and the degree of risk may be comparable. Accordingly, a single assessment of one representative work situation can be applied to other workplaces where the circumstances of use for the hazardous substance(s) are essentially the same.

11.21 Such generic assessments may be undertaken where a single employer controls many similar workplaces, for example, a chain of hardware stores, or by a trade association on behalf of a number of different employers with essentially identical workplaces, for example, service stations. In each case, the individual employer is responsible for ensuring that the generic assessment is valid for that workplace.

WHO SHOULD PERFORM THE ASSESSMENT

11.22 Responsibility for the assessment lies with the employer. It is anticipated that the assessment will usually be done by the employer or manager of the workplace, in cooperation with the relevant employees. Assistance may be sought from relevant professionals, for example, occupational hygienists, with elements of an assessment which require special expertise.

Competency to Perform Assessments

11.23 A person carrying out an assessment is considered competent if he or she has sufficient knowledge and skills to evaluate the health risks to employees arising from operations involving the use of hazardous substances in the workplace.

RECORDING OF ASSESSMENT REPORTS

11.24 Assessments which identify that there is not a significant risk to health do not need to be recorded. It is sufficient to include a notation in the register to indicate that each step of the assessment has been done. This should include the date, the MSDS or equivalent information that was reviewed and a notation that controls are in place.

11.25 Where the assessment indicates that there is a significant risk to health, an assessment report shall be made and kept as a record.

11.26 Assessment reports should reflect the detail of the assessment. They should record sufficient information to show why decisions about risks and precautions were made.

REVISION OF ASSESSMENTS

11.27 The assessment for a particular operation should be revised if:

(a) the process, plant or substance is modified;

(b) new information on the hazards of the substance becomes available;

(c) monitoring or health surveillance indicate inadequate exposure control; or

(d) new or improved control measures become practicable.

11.28 In any case, the assessment shall be reviewed at least every five years. A total, new assessment may not be required, particularly if the operation and degree of exposure to employees are similar to that initially assessed.

LENGTH OF TIME ASSESSMENT REPORTS SHALL BE KEPT

11.29 Assessment reports indicating a need for monitoring and/or health surveillance shall be retained by the employer for at least 30 years.

11.30 Assessment reports not indicating a need for monitoring and/or health surveillance shall be retained by the employer for at least five years.

11.31 The time periods stated above are taken from the date of the last entry made in that report or after it is superseded by a new assessment report.

ACCESS TO ASSESSMENT REPORTS

11.32 Assessment reports should be readily accessible to all employees with potential for exposure to hazardous substances, employee representatives and relevant public authorities.

12. CONTROL

CONSIDERATION OF NECESSARY CONTROL MEASURES

12.1 Exposure to hazardous substances shall be prevented, or where that is not practicable, controlled so as to minimise risks to health.

12.2 So far as practicable, the prevention or control of hazardous substances shall be secured by measures other than the provision of personal protective equipment. Control measures should be implemented in accordance with the hierarchy of controls (***see*** section 12.10 of this national code of practice).

12.3 Control measures are not mutually exclusive and in some circumstances it will be appropriate for the employer to use two or more control measures to reduce exposure to as low a level as is practicable.

12.4 The methods used to control exposure to hazardous substances used in the workplace should be considered in the planning of any new workplace or modifications to an existing workplace. The costs of the control should be considered in the same way, and at the same time, as all other plant and process costs.

12.5 When considering methods to control exposure, all the possible routes of entry of the hazardous substances into the body should be taken into account.

ROLE OF EXPOSURE STANDARDS

12.6 Employers shall ensure that employee exposure to hazardous substances is not greater than the relevant exposure standards for the relevant periods of time listed in the National Commission's *Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment* [NOHSC:1003(1995)][9]. There are different types of exposure standards including time weighted averages, peak and short term exposure limits. Whether a particular exposure standard is exceeded or not should be determined by measurement over an appropriate period of time. The exposure standards publication provides further explanation of the different types of exposure standards and how to determine if they have been exceeded.

12.7 Exposure standards do not represent 'no effect' levels at which every worker can be guaranteed protection. Therefore it is a good general policy to keep the level of exposure to any substance as low as is practicable.

12.8 Compliance with the relevant exposure standard should not preclude further efforts to reduce exposure.

12.9 The absence of a specific exposure standard for a hazardous substance should not be considered an indication that exposure need not be controlled. Where there is no exposure standard, exposure should be controlled to the lowest practicable level. What constitutes the lowest practicable level should be determined during the assessment process.

HIERARCHY OF CONTROL MEASURES

12.10 The hierarchy of control measures is a list of control measures, in priority order, that can be used to eliminate or minimise exposure to hazardous substances. Application of the hierarchy of control measures involves firstly assessing whether a hazardous substance can be eliminated. Where this is not practicable, substitution should be considered. If this is not practicable, consideration should be given to each of the other control measures (isolation,

engineering controls, safe work practices and use of personal protective equipment) in turn, until a control measure or combination of control measures are identified which can achieve the required reduction in exposure. The hierarchy of control measures, in the sequence in which they should be implemented, is given below.

Elimination

12.11 Where a work activity involves the use of a hazardous substance that is not essential, the hazardous substance should be eliminated wherever practicable. Examples of elimination include:

(a) using a physical process rather than a chemical process to clean an object, for example, use of ultra-sound;

(b) using clips, clamps or bolts instead of an adhesive; and

(c) purchasing supplies of a material in a ready-cut and sized form rather than carrying out dust-producing cutting processes on site.

Substitution

12.12 Substitution includes substituting a less hazardous substance, the same substance in a less hazardous form or the same substance in a less hazardous process. Examples of substitution include:

(a) replacing a chlorinated degreasing solvent with a detergent;

(b) using a water-based paint in place of an organic solvent-based paint;

(c) using a substance in paste or pellet form rather than a dusty powder; and

(d) brush application of paint rather than aerosol application.

Isolation

12.13 Isolation involves separation of the process from people by distance or the use of barriers to prevent exposure. An example is the remote operation of a process.

Engineering Controls

12.14 Engineering controls are plant or processes which minimise the generation of hazardous substances, suppress or contain hazardous substances, or which limit the area of contamination in the event of spills or leaks. Types of engineering controls include enclosure or partial enclosure, local exhaust ventilation and automation of processes. Some examples of engineering controls are:

(a) ventilated booths for spray painting or fibre glassing;

(b) robot welding;

(c) local extraction systems attached to grinding machines;

(d) automation of the removal of objects from degreasing baths; and

(e) closed reaction vessels.

Safe Work Practices

12.15 Safe work practices are administrative practices which require people to work in safer ways. Examples of safe work practices include:

(a) reducing the number of employees exposed;

(b) excluding any access which is not essential;

(c) reducing the period of exposure for employees;

(d) regular cleaning of contamination from walls and surfaces;

(e) providing means for safe storage and disposal of hazardous substances;

(f) prohibiting eating, drinking and smoking in contaminated areas;

(g) vacuuming dust from areas where cutting processes take place;

(h) keeping lids on containers when not in use; and

(i) providing and using facilities for effective decontamination.

Personal Protective Equipment

12.16 The use of personal protective equipment as a control measure shall be limited to situations where other control measures are not practicable or where personal protective equipment is used in conjunction with other measures to increase protection.

12.17 Situations where use of suitable personal protective equipment may be necessary include:

(a) where it is not technically feasible to achieve adequate control by other means (in these cases, exposure shall be reduced as far as practicable by other measures and then, in addition, suitable personal protective equipment should be used to secure adequate control);

(b) where personal protective equipment is necessary to safeguard health until such time as adequate control is achieved by other means, for example, where urgent action is required because of plant failure; or

(c) during routine maintenance operations where the infrequency and small number of people involved may make other control measures inpracticable.

12.18 Where personal protective equipment is used, employers shall ensure that it is:

(a) properly selected for the individual and task;

(b) readily available;

(c) clean and functional;

(d) correctly used when required; and

(e) maintained by appropriately trained staff in accordance with a personal protective equipment maintenance and servicing program.

12.19 Personal protective equipment should be selected and used in accordance with the relevant Australian Standards, in particular:

(a) eye protection should comply with AS 1337 *Eye Protection for Industrial Applications*[10] and be selected and used in accordance with AS 1336 *Recommended Practices for Eye Protection in the Industrial Environment*[11];

(b) respiratory protection should comply with AS 1716 *Respiratory Protective Devices*[12] and be selected in accordance with AS 1715 *Selection, Use and Maintenance of Respiratory Protective Devices*[13];

(c) hand protection should comply with AS 2161 *Industrial Safety Gloves and Mittens (Excluding Electrical and Medical Gloves)*[14];

(d) foot protection should comply with AS 2210 *Safety Footwear*[15];

(e) head protection should comply with AS 1801 *Industrial Safety Helmets*[16] and be used in accordance with AS 1800 *Selection, Care and Use of Industrial Safety Helmets*[17]; and

(f) clothing for protection against chemicals should comply with AS 3765 *Clothing for Protection Against Hazardous Chemicals*[18].

12.20 In some emergency situations, more specialised personal protective equipment may be required.

MAINTENANCE, EXAMINATION AND TESTING OF CONTROL MEASURES

12.21 The employer shall ensure that all control measures perform as originally intended and continue to prevent or adequately control exposure of employees to hazardous substances.

12.22 Where engineering control measures are used to control exposure, they should be thoroughly examined and tested at specified intervals to ensure effective performance.

12.23 Preventive servicing procedures should be established specifying which control measures require servicing, the servicing needed, the frequency of servicing, who is responsible, how any defects will be corrected, performance testing and evaluation standards, and records of servicing.

EMERGENCY PROCEDURES

12.24 In spite of the implementation of all practicable control measures, a leak, spill or uncontrolled release of a hazardous substance could still occur. Established emergency procedures, procedures for safe disposal of the substance and sufficient suitable personal protective equipment should be used, where appropriate, to enable the source of the release to be safely identified and repairs made. All persons not directly concerned with the emergency should be excluded from the area of contamination.

13. MONITORING

WHAT MONITORING IS

13.1 Monitoring involves the use of valid and suitable techniques to derive a quantitative estimate of the exposure of employees to hazardous substances. For airborne contaminants, monitoring involves the periodic and/or continuous sampling of workplace atmospheres to derive a quantitative measure of exposure to hazardous substances through inhalation. For this sort of monitoring to be of value in risk assessment, there must be a relevant exposure standard against which to compare the results obtained.

A COMPETENT PERSON TO UNDERTAKE MONITORING

13.2 Monitoring should only be carried out by a competent person who has sufficient knowledge, skills and experience in the appropriate techniques and procedures detailed in section 13.6 of this national code of practice.

WHEN MONITORING IS REQUIRED

13.3 Monitoring may be required as part of the assessment of risk where it is necessary to obtain a quantitative estimate of exposure, or to determine the effectiveness of measures introduced to control exposure.

13.4 If the level of atmospheric contamination routinely approaches the relevant exposure standard, there should be a review of the control measures to ensure that exposure is controlled as far as practicable.

13.5 Reference should be made to relevant technical literature, including National Commission or Commonwealth/State/Territory standards, codes of practice, guidance notes and guides, for information on other situations where monitoring is needed. (***See*** Appendix 1 for further information sources.)

PROCEDURES FOR MONITORING

13.6 Procedures for monitoring should detail:

(a) when and how the monitoring is to be done;

(b) the sampling procedures and analytical methods to be used;

(c) the sites and frequency of sampling; and

(d) how the results are to be interpreted.

RESULTS OF MONITORING

13.7 The results of monitoring shall be recorded. The records should contain sufficient detail to determine:

(a) the hazardous substances concerned, what the results were and when the monitoring was done;

(b) what monitoring procedures were adopted including the duration of sampling;

(c) the locations where samples were taken, the operations in progress at the time and, in the case of personal samples, the names of those individuals concerned;

(d) whether the results reflected normal operating conditions;

(e) how the results were interpreted; and

(f) the effectiveness of control.

HOW MONITORING RESULTS SHOULD BE KEPT

13.8 The records of monitoring may be kept in any form, but in all cases the information should be readily retrievable and in an easily understood form. Records should be kept in such a way that the results can be compared with any health records required under the health surveillance requirements of the national model regulations.

LENGTH OF TIME MONITORING RESULTS SHALL BE KEPT

13.9 The results of monitoring shall be kept for at least 30 years from the date of the last entry made in the records.

ACCESS TO MONITORING RESULTS

13.10 The results of monitoring shall be provided to those employees with the potential for exposure to hazardous substances subject to monitoring. Records of workplace monitoring shall be readily accessible to employees, employee representatives and relevant public authorities.

14. HEALTH SURVEILLANCE

PURPOSE OF HEALTH SURVEILLANCE

14.1 Health surveillance, which includes biological monitoring, can assist in minimising the risk to health from hazardous substances for which there are known and acceptable health surveillance procedures by:

(a) confirming that the absorbed dose is below the accepted level;

(b) indicating biological effects requiring cessation or reduction of exposure; or

(c) collecting data to evaluate the effects of exposure.

14.2 Health surveillance should not be used as an alternative to maintenance of control measures. Further information on health surveillance is at Appendix 2.

THOSE EMPLOYEES REQUIRING HEALTH SURVEILLANCE

14.3 Health surveillance is required for employees who have been identified in the workplace assessment as having:

(a) a significant risk to health from one of the hazardous substances listed at Schedule 3 to the national model regulations;

(b) exposure to a hazardous substance for which:

(i) an identifiable disease or health effect may be related to the exposure,

(ii) there is reasonable likelihood that the disease or health effect may occur under the particular conditions of work, and

(iii) there are valid techniques for detecting indications of the disease or the effect; or

(c) where there is a valid biological monitoring procedure available and a reasonable likelihood that values might be exceeded.

14.4 Employees should participate in the health surveillance program unless there is some compelling reason to the contrary, in which case the matter should be discussed with the registered medical practitioner responsible for the health surveillance program.

RESPONSIBILITY FOR HEALTH SURVEILLANCE

14.5 The employer is responsible for providing health surveillance which has been established as necessary as a result of the assessment process. A registered medical practitioner shall be responsible for the supervision of health surveillance, either by directly carrying out the health surveillance program or by supervising a program carried out by a suitably qualified person such as an occupational health nurse. Coordination of the selection of a registered medical practitioner to supervise health surveillance is the responsibility of the employer, in order to ensure that consistent methods are used for the health surveillance of employees exposed to the same hazardous substance. However, the selection of the registered medical practitioner shall be done in consultation with the employees concerned in order to give these employees a reasonable choice in the selection of the medical practitioner. In

normal circumstances, the registered medical practitioner should be appropriately qualified in occupational medicine.

EMPLOYER RESPONSIBILITIES

14.6 The employer shall:

(a) pay any reasonable expenses due to health surveillance, for example, medical fees, pathology tests, travelling expenses and time off work; and

(b) ensure that health surveillance results obtained are retained as a confidential record for the purposes of the national model regulations.

14.7 The employer should also:

(a) inform employees of the purpose and procedures for health surveillance;

(b) make acceptable arrangements for employees to participate in the health surveillance program;

(c) provide the registered medical practitioner with access to a list of the hazardous substances for which employees are required to have health surveillance and a copy of the MSDS and exposure standards information for those hazardous substances; and

(d) permit the registered medical practitioner to have access to any relevant assessment reports.

14.8 Where the employer receives notice from the registered medical practitioner of an adverse health surveillance result considered by the practitioner to be related to exposure to a hazardous substance in the workplace, action should be taken, as soon as practicable, to reassess the workplace and to provide appropriate controls to minimise any further risks to health or safety.

14.9 Where a registered medical practitioner has certified that an employee is unfit for further exposure to a hazardous substance in the workplace or should only work under conditions specified by the medical practitioner, the employer should follow these recommendations. This may involve relocating the employee to suitable alternative work or changes to the work to prevent exposure. This should be done only after consultation with the employee, employee representatives and the registered medical practitioner.

A SUITABLY TRAINED REGISTERED MEDICAL PRACTITIONER

14.10 Where there are no registered medical practitioners authorised by the relevant public authority for a specified test or examination, the registered medical practitioner shall be adequately trained to undertake the health surveillance. The registered medical practitioner should also have an understanding of the employees' work activities and be aware of his or her own duties under the national model regulations.

THE APPOINTED REGISTERED MEDICAL PRACTITIONER'S RESPONSIBILITIES

14.11 The responsibilities of the appointed registered medical practitioner are to:

(a) assist with the planning and implementation of health surveillance;

(b) maintain medical records and ensure their confidentiality;

(c) advise each employee of the results of his or her health surveillance, provide any necessary explanation and arrange treatment, preventive measures or rehabilitation, if necessary;

(d) decide if a clinical finding or examination result is abnormal, if a trend is significant and whether this indicates an unacceptable level of exposure to a hazardous substance;

(e) notify the employer of the outcome of health surveillance and of any trends which indicate inadequate control and the need for remedial action (the information provided to the employer shall allow the registered medical practitioner to maintain medical confidentiality);

(f) notify the relevant public authority of any adverse effect prescribed by that authority; and

(g) ensure that health surveillance results are maintained as confidential medical records, and in doing so:

(i) clearly identify them from records obtained for other purposes such as records of examinations not connected with health surveillance, and

(ii) provide the relevant public authority with all health surveillance records in their possession on cessation of their medical practice.

LENGTH OF TIME HEALTH SURVEILLANCE RESULTS SHALL BE KEPT

14.12 The results of health surveillance shall be kept by the employer for at least 30 years from the date of the last entry made in the records.

15. RECORD KEEPING

WHAT THE EMPLOYER NEEDS TO KEEP AS RECORDS

15.1 Assessment reports which indicate a need for monitoring and/or health surveillance together with the results of monitoring and/or health surveillance shall be kept as records in a suitable form for at least 30 years from the date of the last entry made. Retention for a period of at least 30 years is necessary because some health effects, such as cancers, may take a long time to become evident. The information kept will be valuable in epidemiological studies and for developing effective control strategies.

15.2 All other records, including assessment reports not indicating a need for monitoring and/or health surveillance and records of induction and training, shall be maintained for at least five years in a suitable form.

STORAGE OF RECORDS

15.3 Records should be located conveniently so that managers, employees and employee representatives can gain access to the information to which they are entitled. Suitable storage systems for records include traditional book entry records, microfiche or computerised databases.

15.4 The employer should provide to the relevant public authority all records required to be kept for 30 years after that period has expired.

WHEN AN EMPLOYER CEASES TO TRADE

15.5 If an organisation ceases to trade, then the records shall be provided to the relevant public authority. Where ownership of an organisation is transferred, the records should be maintained and kept for the required period by the subsequent owner.

16. EMPLOYEES' DUTIES

EMPLOYEE RESPONSIBILITIES

16.1 Employees have a responsibility to maintain safe work practices to the extent that they are capable. This is specifically addressed in Commonwealth/State/Territory occupational health and safety legislation and is dependent on adequate induction, training and supervision by the employer.

EMPLOYEE RESPONSIBILITIES FOR CONTROL

16.2 Employees should use the control measures in the way that they are intended to be used and, in particular, should:

(a) cooperate with their employer in performing the assessments of hazardous substances in the workplace;

(b) participate in suitable induction and training programs;

(c) use the control measures provided for hazardous substances, plant and processes;

(d) wear, in a proper manner, the personal protective equipment provided;

(e) store personal protective equipment in the accommodation provided when it is not in use;

(f) remove from their bodies any protective equipment which could cause contamination, and wash before eating, drinking or smoking;

(g) 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;

(h) report promptly to their employer, through their supervisor, any defects discovered in any control measure, device, facility, label or item of personal protective equipment which may affect compliance with the provisions of the national model regulations; and

(i) cooperate with their employers in the conduct of appropriate monitoring or health surveillance programs that arise from assessments.

NEED FOR EMPLOYEES TO APPLY INFORMATION

16.3 Employees should, to the best of their ability, apply the information that they have been provided with to improve the health and safety standards in their work environment.

17. RELEVANT PUBLIC AUTHORITIES AND EMERGENCY SERVICES

ACCESS TO INFORMATION

17.1 Relevant public authorities shall have access to all records maintained by the employer for the purposes of the national model regulations, subject to confidentiality being maintained where required by the national model regulations.

17.2 It is essential that emergency services have information on the hazards present at any location involving the manufacture, use, storage or disposal of hazardous substances, as well as other relevant information such as the location of water hydrants, the workplace register, assessment reports and emergency response plan. However, it is not appropriate or necessary for emergency services to have access to monitoring or health surveillance results. The employer should cooperate with requests for information and make such information available as soon as practicable.

17.3 Employers should prepare a suitable emergency response plan in consultation with emergency services, where appropriate.

APPENDIX 1

MONITORING

A1.1 Advice on suitable sampling techniques and methods of analysis may be found in publications including:

(a) Australian Standards, from Standards Australia, Sydney, for example:

- AS 3640 *Workplace Atmospheres - Method for Sampling and Gravimetric Determination of Inspirable Dust*[19],
- AS 2985 *Workplace Atmospheres - Method for Sampling and Gravimetric Determination of Respirable Dust*[20], and
- AS 2986 *Workplace Atmospheres - Organic Vapours - Sampling by Solid Adsorption Techniques*[21];

(b) the National Commission's *Exposure Standards for Atmospheric Contaminants in the Occupational Environment* [NOHSC: 1003(1991)][9];

(c) the United Kingdom Health and Safety Executive's 'Monitoring Strategies for Toxic Substances', *Environmental Hygiene*, No. 42,[22];

(d) the United Kingdom Health and Safety Executive's *Methods for the Determination of Hazardous Substances*, MDHS Series[23];

(e) the United States National Institute of Occupational Safety and Health's *Manual of Analytical Methods*[24]; and

(f) the United States National Institute of Occupational Safety and Health's *Occupational Exposure Sampling Strategy Manual*[25].

APPENDIX 2

HEALTH SURVEILLANCE

TYPES OF HEALTH SURVEILLANCE

A2.1 The type of health surveillance needed should be carefully considered. The types of procedures which may be followed include:

(a) biological monitoring, for example, measurement and assessment of hazardous substances or their metabolites in blood, urine or expired air (biological monitoring may be complementary to atmospheric monitoring);

(b) medical tests;

(c) medical examination;

(d) a review of present and past medical and work history; and

(e) a review of medical records and occupational exposure.

A2.2 These procedures are not mutually exclusive and the results from one procedure may indicate the need for another. Non-invasive methods of testing, for example, analysis of expired air, are generally preferable to invasive methods, for example, blood analysis, where equally meaningful results can be obtained.

A2.3 Where a method of health surveillance is specified for a particular substance in National Commission or Commonwealth/State/Territory standards, codes of practice, guidance notes or guides, that method should be used. The Australian College of Occupational Medicine has produced a brochure *Health Assessment for Work - A Guide*[26].

WHAT HEALTH SURVEILLANCE SHOULD COVER

A2.4 Health surveillance should take into consideration:

(a) the nature and extent, including duration, of exposure;

(b) the changes attributable to exposure which may occur in exposed workers and the likelihood that a disease or adverse health effect may occur, which must both be related to the nature and degree of exposure;

(c) the frequency at which any changes may be expected to occur;

(d) an assessment of available epidemiological information on human exposure and toxicological data;

(e) the sensitivity, specificity and reliability of the detection and measurement of these changes;

(f) the remedial action which is available to reverse or arrest these changes; and

(g) the resources and levels of competence required to perform the necessary detection and/or measurement procedures.

A2.5 Valid techniques for use in health surveillance are those of acceptably high sensitivity and specificity which can detect adverse effects related to the nature and degree of exposure. Health surveillance procedures should be safe, easy to perform, non-invasive, where possible, and acceptable to employees. There should be criteria for interpreting the data obtained.

A2.6 Health surveillance should be maintained for as long as the workplace assessment determines that it is necessary. In certain cases, it may be appropriate, on advice from a registered medical practitioner, for an employer to continue to provide health surveillance to employees after exposure to a hazardous substance has ceased.

THE ROLE OF BIOLOGICAL MONITORING

A2.7 The assessment of the airborne concentration of a particular contaminant and the subsequent comparison with the appropriate exposure standard(s) is usually the primary technique for monitoring the working environment. However, in some situations this approach may be complemented by the use of biological monitoring techniques which measure the levels of the substance or its metabolite(s) in body fluids, such as sweat, urine or blood, or in exhaled breath.

A2.8 Employees differ from each other in size, fitness, personal hygiene, work practices, smoking habits, alcohol and drug usage, and nutritional status. There are thus differences between individuals in uptake, metabolism and excretion of toxic substances, and in response to a particular hazardous substance. Biological monitoring has the specific advantage that it can take account of these differences, enabling individual risk assessments to be made. As such, in certain circumstances, biological monitoring serves as a useful adjunct to atmospheric monitoring in assessing actual occupational exposure.

A2.9 For a limited number of substances, the application of biological monitoring can be particularly useful in suggesting the degree of skin absorption and, in some cases, can identify unknown or unexpected exposures which cannot be predicted from atmospheric monitoring alone. However, biological monitoring does have limitations, particularly in regard to the collection and preservation of samples and the interpretation of results. There is limited knowledge of suitable and definitive biological tests for most substances.

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3. National Occupational Health and Safety Commission, *List of Designated Hazardous Substances* [NOHSC:10005(1994)], Australian Government Publishing Service, Canberra, 1994.

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5. Federal Office of Road Safety, *Australian Code for the Transport of Dangerous Goods by Road and Rail*, 5th Edition, Australian Government Publishing Service, Canberra, September 1992.

6. Summary reports are published in the *Chemical Gazette*, which is produced each month and can be purchased through Commonwealth Government Bookshops.

7. Standards Australia, AS 1319 *Safety Signs for the Occupational Environment*, Standards Australia, Sydney.

8. Standards Australia, *AS* 1345 *Identification of the Contents of Piping, Conduits and Ducts*, Standards Australia, Sydney.

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