CHAPTER 8

Occupational Health

Introduction

307. While the Inquiry has been concerned with the effects of chemicals on occupational health and safety, the machinery necessary to overcome the present deficiencies necessarily goes beyond chemical health and safety. The Committee believes that the division of responsibilities between labour and health authorities for occupational health and safety inspectorates is anachronistic. A single body responsible for occupational health and safety administration is essential if chemical hazards in the workplace are to be properly controlled. The Report of the New South Wales Commission of Inquiry into Occupational Health and Safety (The Williams Report) in June 1981 stated:

> It should be made clear that . . . health and safety are not separate entities. The correct view is that the two are conceptually indivisible and should not be considered separately.[88]

The trend of developments overseas is clearly towards the establishment of a single national occupational safety and health body. Such bodies are responsible for research, collection and dissemination of information and the setting of standards, guidelines and codes of practice. The appropriateness of such a body for Australia is discussed in the next Chapter.

Nature of Hazards

308. As mentioned earlier, occupational exposure to chemicals is the area where some of the highest levels of chemical exposures occur, where the overall assessment of the chemicals involved is poorest and where legislation and its enforcement is weak.

309. Virtually all chemical substances are either developed, manufactured, processed or used in a working environment. Exposure to chemicals in the working environment is not limited to manufacturing but occurs in activities such as research, manufacture, handling, storage, transport, retailing and service industries. In many workplaces, controls are grossly inadequate. Unless proper safeguards are devised and put into operation, people will continue to be unduly exposed to chemicals having short-term or long-term deleterious effects.

310. Adverse effects cover a broad range of illness or disease from minor skin, respiratory or eye irritation through to serious injury to vital organs, permanently damaging a person's health. In many cases, death is a direct result. Debilitating effects such as occupational asthma, or narcotic or neuropathic effects may not be readily identified as work related. Occupational hazards from chemicals differ from physical hazards in that their causes are often not so readily identified. Some deleterious effects of chemicals may manifest themselves immediately or soon after exposure such that their hazardous nature is readily identified. Other deleterious effects, such as those of carcinogens or mutagens, do not manifest themselves quickly. Rather it takes years, sometimes up to 40 years, or subsequent generations, before the damage is manifested.

311. Most workplaces today use some potentially hazardous chemicals. Many industries in which chemical exposures occur are not commonly thought of as chemical industries. For example:

- Evidence given by the Clothing and Allied Trades Union pointed to the range of quite hazardous materials that workers in the clothing and dry-cleaning industries are exposed to. These include solvents such as benzene, toluene, tetrachloroethylene and trichloroethylene. Other chemicals such as carbon disulphide, benzidene dyes (known human carcinogens), formaldehyde and flame retardant and waterproofing sprays are either used in clothing trade processes or are released from materials during their use in manufacture.
- Fumes in a degreasing tank in a paint factory in Melbourne recently caused the deaths of two youths.
- Asbestos filters are still used in some beer, wine and other food processing with consequent exposure of employees.
- Many adhesives release solvents, propellants or other fumes which have toxic effects. These are used, often intensively, in a wide range of industries.
- Photocopiers and offset printers, often in confined office spaces, use solvents and other potentially hazardous chemicals.

Many small factories do not have access to adequate information on chemical hazards and lack the technical resources for hazard control.

312. The diversity of health risks shown in the four illustrative studies in this Report (Chapters 11-14) demonstrate the need for improved occupational health management. As mentioned in Chapter 1, 80 per cent of human cancer owes its origin to environmental factors with a minimum of four per cent and possibly up to 20 per cent being occupational cancers. It is fair to assume that many mutagens, carcinogens, teratogens, and substances which facilitate or encourage them and which are present in the environment have not been identified as such. Many substances used for years without any obvious problems may, on proper assessment, prove hazardous. The statistical data available for epidemiological studies of chemical effects in the workplace is extremely limited in Australia.

313. Occupational exposure has led to the recognition of many substances as being carcinogenic in humans. The recognition of occupational disease, particularly occupational cancer, has usually been facilitated by those exposed being an identifiable group, and the nature and site of the disease being relatively uncommon in the community. It could be that quite a number of diseases of occupational origin remain unidentified as those exposed do not form a readily identifiable group, the offending chemical has not been continually used over long periods for the same purpose or the site or nature of the disease is not uncommon in the population as a whole.

314. It is not only the toxic effects of a particular chemical in the workplace that are relevant but also the cumulative and synergistic effects of the range of chemicals used in the particular work environment together with those used privately, such as cigarettes, alcohol and pharmaceuticals.

Cost of Occupational Disease

315. Due to deficiencies in the diagnostic skills of general medical practitioners there is an under-reporting of chemically induced occupational disease. Even where an illness is identified as being due to chemical exposure there is a serious lack of reliable statistics on the overall incidence of such injuries in Australia and the cost involved. The

statistics gathered on time lost due to occupational injuries and diseases are only partial and are not comparable between States. It must be stressed that many of these injuries and diseases would be unrelated to hazardous chemicals. Estimates cannot be regarded as being very reliable. Mindful of these qualifications, the best estimates available to the Committee are that about four times as much time is lost due to industrial accidents and injuries as is lost due to industrial disputes.[89] While considerable publicity is given to the cost of industrial disputes it is estimated that in recent years the cost of industrial accidents and injuries in Australia exceeded four billion dollars a year and time lost is around one million man weeks per year.[90]

316. If these estimates are in any way close to the real figure, the enormous economic burden on the community together with the suffering and associated social costs are intolerably high. The Minister for Employment and Industrial Relations, the Hon. I. M. Macphee, M.P., said recently that 'costs of that order of magnitude put beyond doubt that Australia's performance in the occupational safety and health field is deplorable'.[91] At a time when concern is being expressed at the rising cost of health services, insufficient effort is being made in the area of prevention. The paucity of basic injury and disease data goes hand in hand with the low priority given to prevention in the occupational health area. The Committee recommends that:

> **the Australian Bureau of Statistics be required to collect and publish uniform national statistics on the cost and time lost due to occupational accidents and disease.**

317. In his 1980-81 Annual Report, the Commonwealth Director-General of Health stated:

> Occupational health and safety is still a comparatively neglected area of endeavour in Australia with uncoordinated policies, programs, and priorities and little formal training for professionals in the field.[92]

The ACTU along with many other witnesses, regards legislation on occupational health and safety as generally inadequate with the limited standards that are laid down being inadequately enforced. Many submissions have detailed instances of neglect by employers, employees, inspectorates of departments of health, environment and labour as well as by manufacturers and importers of products.

Existing Legislation

318. The constitutional responsibility for ensuring occupational health and safety has been seen primarily as a State responsibility with the Commonwealth being responsible for its own employees, the ACT and external territories.

319. In most States, legislation governing occupational safety and health is split between labour and health ministries and in some States the Mines Department is also involved. As a consequence, the responsibility for administering the main acts is split between these departments and in addition there are usually a number of sundry acts or sets of regulations which include aspects of occupational safety and health in their coverage. Inspectorates are also split between departments and are generally regarded as having insufficient staff numbers. Many workplaces and categories of workers are not covered by present legislation. The Australian Capital Territory lacks basic occupational health and safety legislation.

320. An indication of the range of legislation can be gained from the list of relevant Acts provided by the NSW Government. These were:

> Factories, Shops and Industries Act
>
> Public Health Act

Dangerous Goods Act
Therapeutic Goods and Cosmetics Act
Poisons Act
Radioactive Substances Act
Clean Waters Act
State Pollution Control Commission Act, and
Pesticides Act.

321. There are approximately 159 Acts and Ordinances pertaining to health and safety, including Industrial Arbitration Acts. These comprise 128 State, ten Federal and eleven Northern Territory Acts together with ten ACT Ordinances. (The ACT Ordinances are limited in their coverage.) Much of this legislation is based on United Kingdom legislation drafted last century. As a consequence, much of the existing legislation is out of date, approaches the problem of occupational safety and health in a piecemeal fashion, is not readily amended to keep abreast of developments and does not cover all workplaces, employees or employers. This fragmented legislation from a past era is a cumbersome and ineffective way in which to ensure safe, healthy and productive workplaces in the last quarter of the twentieth century.

322. In recognition of these deficiencies, a model bill for an Industrial Safety Health and Welfare Act has been adopted by the Australian Ministers for Labour. This followed on the UK Health and Safety at Work Act 1974 which resulted from the Report of the Committee on Safety and Health at Work (Robens Committee). South Australia and Tasmania have passed new legislation along the lines of the model bill. A Victorian review committee recommended in 1978 that the new legislation be adopted and a Bill was introduced. The Victorian Bill has been recently withdrawn for substantial re-drafting. New South Wales conducted a public inquiry during 1980-81 into occupational health and safety. The Report of the Inquiry (Williams Report) was released late in 1981 and the New South Wales Government announced in May 1982 that it will legislate on the basis of the recommendations of the Williams Report.

Inspections, Monitoring and Enforcement

323. Inspectors from labour inspectorates generally have tradesman qualifications and carry out inspections on physical safety measures. Very few have tertiary qualifications in scientific areas. For example, the New South Wales Government stated that out of 200 labour inspectors across the State, six in head office specialised in occupational health. The New South Wales Health Commission Industrial Hygiene Branch has a staff of 43 with 10 of those qualified to investigate toxic chemicals.[93] Professor Ferguson of the Commonwealth Institute of Health, the only Professor of Occupational Health in Australia, said of health inspectorates:

> Each state division of occupational health is inadequately equipped to handle the investigatory, regulatory, consultative and educational service functions for its region.[94]

The Australian and New Zealand Society of Occupational Medicine agrees with that assessment.[95]

324. Most inspections are in response to a complaint or requests for assistance rather than as part of a system of regular inspection and enforcement. The South Australian Government noted that it did not have enough inspectors to regularly inspect all of the factories in the metropolitan area.[96] The same can be said of all State inspectorates. Inspectors sometimes concentrate on problem industries where hazards are identified through injury reports or interstate or overseas information. Apart from these instances, if employers and/or employees are unaware of a hazard then it is highly

unlikely to be detected by the health or safety inspectorates. There is no comprehensive program for actively disseminating to employers or employees information on chemical hazards and their management. Such a program would need to be backed up by up-to-date legislation, inspection and enforcement. The Committee has heard evidence that chemical exposure standards have been only sporadically updated and that observance of the standards is very rarely monitored and even more rarely enforced.

325. The Commonwealth Department of Health gave evidence that occupational physicians working in State occupational hygiene sections have no statutory powers. They can make recommendations as to safe working conditions but cannot enforce them, enforcement being the responsibility of the labour or industrial relations department. The NSW Government emphasised that labour inspectors do not carry out investigations as these are carried out by Health personnel. The Victorian Environment Protection Authority representative said its inspectors had little contact with conditions inside factories and with health authorities. Evidence was given that enforcement action by EPA inspectors to prevent pollution of the environment by factories had in several instances worsened the atmosphere inside the factory. The NSW Government indicated that inspection of occupational health in factories sometimes followed from information passed on after environmental inspections. Occupational physicians arrange monitoring within the capacity of limited resources. Factory inspectorates also do monitoring. The Commonwealth Department of Health pointed to the lack of power of State occupational health authorities to order systematic longitudinal studies of the health of industrial workers, (e.g. coke oven or aluminium smelter workers). Studies are therefore only possible with the cooperation of those industries with their own occupational health services.

326. A number of submissions claimed that health authorities are conservative in estimating hazards posed by chemicals. All too often inspections rely solely on visual inspection and do not involve measurement of atmospheric contaminant levels.

Inspectorate

327. The individual inspectorates form the crucial connection between legislation, regulations and standards and their implementation throughout industry.

328. Criticisms made of the United Kingdom inspectorates before the implementation of the 1974 Health and Safety at Work Act seem directly relevant to the situation in Australia. The UK industrial legislation, which was similar to current Australian legislation enacted prior to 1970, laid down a criminal code for health and safety at work, breaches of which gave rise to liability for prosecution in the criminal courts. The tendency was for the law enforcement officers, i.e. the labour and health inspectors, to regard their job as one of persuading an employer who broke the law to see the error of his ways through discussion or warnings rather than to prosecute him for offences committed.

329. As in Australia, there was an inadequate number of inspectors and preparing a case for prosecution and attending court to prosecute was a time consuming business. The Williams Report in NSW stated that breaches of industrial legislation or regulations have long been regarded as being quasi-criminal offences only, whatever the gravity of the circumstances surrounding the offence, resulting in inadequate penalties.[97] The Commissioner, Mr Williams, was a retired industrial magistrate. Not surprisingly, inspectors in the United Kingdom sought to work through persuasion and education rather than prosecuting offenders. This approach led one of the Law Lords in 1972 to describe the attitude of inspectors as 'supine'. This judgement of Lord Salmon concerning the enforcement of asbestos regulations is further discussed in Chapter 11.

330. Evidence to the present Inquiry from several witnesses objected to inspectors allegedly liaising only with employers when inspecting a workplace, even when the inspection was requested by employees. Employee representatives do not usually accompany inspectors on inspections and employees are often unaware that an inspection has taken place. In the ACT, occupational health officers can only enter premises by invitation of the employer. Not surprisingly, faith in the inspectorial system by employees is low. The inadequate resources available within inspectorates, their avoidance of prosecutions, together with the lenient attitudes of the courts have lead to an incapacity on the part of the inspectorate to ensure safe working conditions. The establishment of occupational health and safety units by the ACTU, other union groups and individual unions illustrates the rising concern of employees and a lack of faith in the effectiveness of the inspectorates. The work of inspectors would be made easier if adequate information on chemical hazards and safe management were made available to all employers. At present, too much is asked of inspectors in being at one and the same time, educators and technical advisors as well as enforcement officers.

331. The number of chemicals involved, the number and variety of workplaces and the substantial training required to provide skilled inspectors make it clear that it is not feasible to provide enough skilled inspectors to regularly inspect and monitor each workplace where hazardous chemicals are being used. Additional control mechanisms are clearly necessary. The Director-General of the World Health Organisation, Dr H. Mahler, said during a recent visit to Australia:

> those in the health delivery business have to depend on a resource somewhat overlooked in the comfortable industrial world: people themselves and their wish to be well . . . If you look at what is happening in modern industrial society then you realise how much improvement depends on what people themselves decide to do, or not to do.[98]

The Committee believes these comments are directly relevant to the management of chemicals in the workplace. Personnel in the workplace, both employer and employee, can, with adequate training and information, perform many of the inspections, assessment and monitoring tasks presently expected of health and safety inspectorates. Inspectors being a scarce resource could then be free to assist in resolving more difficult problems and policing problem areas.

332. Workplace health and safety committees with equal employer and employee representation are becoming increasingly common in well-conducted workplaces. These workplace committees are a requirement of occupational health and safety legislation in a number of countries. The Committee believes that workplace health and safety committees are essential if optimum health and safety standards are to be established and maintained in each workplace. The Committee recommends that:

> **health and safety committees be a requirement for each workplace with their rights and obligations specified in legislation.**

Information

333. The lack of information available to employees was seen as a major problem by many witnesses. This lack of knowledge about the chemicals used and their hazardous properties often extends to employers. Problems include inadequate labelling, where a product is identified only by a code number, and the lack of safety directions and warnings. Government occupational health services have not generally gone into the workplace actively disseminating chemical safety and health information.

334. The lack of an identifiable and accessible source of independent but reliable information was a major concern for many witnesses. This has undoubtedly been

another factor in unions setting up their own occupational health and safety centres. The Australian Chemical Industry Council stated 'At the shop floor level information is really necessary. It is quite useless having information unless it gets into the hand of the end user'.

335. The US Department of Health, Education and Welfare has produced a 600 page book 'Occupational Diseases—A Guide to their Recognition' which is concise, comprehensive, intelligible to the informed lay person and provides specialist references. It is written by the National Institute for Occupational Safety and Health (NIOSH). There is no comparable manual for Australian conditions.

336. There is a lack of accurate estimates of the numbers of chemicals used in the workplace. The South Australian Government pointed to the 13 000 chemicals listed by NIOSH with 2 000 chemicals listed as suspect carcinogens. While the United States figure would be considerably higher than the number of chemicals in use in Australia it is still a large number that requires appropriate regulation, with the setting of standards and monitoring where appropriate. The volume of information required on their toxicology for their safe management and safe handling is immense. The Myers Report on Technological Change in Australia observed:

> Problems may arise in some instances because of a lack of knowledge on the control, safe use and storage of such substances; more often they result from inadequate dissemination and application of existing material.[99]

Several departmental witnesses have expressed concern over the difficulty of keeping up with the ever-increasing flood of new information. This problem is exacerbated when each agency does its own information gathering, collation and dissemination.

337. As mentioned earlier, the NH & MRC has produced codes of practice and guides for the use of a limited number of hazardous chemicals. They have also recommended to State and Commonwealth Governments maximum safe working levels for many chemicals in the air. Monitoring of chemical levels in the air is often very difficult as air sampling techniques remain somewhat uncertain. It is usual in specifying a maximum safe level of a chemical in the air for the method of testing to be also specified. If health staff and factory inspectorates are understaffed then monitoring is likely to be inadequate and the exercise of setting statutory emission or workplace minimum standards is of little practical value. Air monitoring is an indirect method of regulating biological effects. This nexus should always be kept in mind and biological monitoring such as urine or blood sampling used where appropriate.

Product Safety Sheets

338. Product safety sheets were dealt with earlier as an important form in which chemical information can be provided. The single most important use of product safety sheets is in the workplace.

339. The Industrial Safety Codes Regulations 1975 of South Australia, based on the model bill for occupational safety health and welfare, require in part:

> The occupier of industrial premises in which harmful substances in solid, liquid or gaseous form are . . . used . . . shall ensure that all necessary precautions are taken to protect workers from such harmful substances.[100]
>
> Workers shall be made aware of the dangers of any harmful substances handled or used in or at the work place, and shall be advised by the occupier or some person acting on his behalf of precautions to be observed when handling or working with such substances.[101]

340. As these essential requirements pass into legislation around Australia there will be an increasing legal requirement to have safety and toxicity data on all materials used in the workplace. The practical necessity of this information has long existed. The State Electricity Commission of Victoria stated that the majority of chemicals and chemical products used by their employees were proprietary products for which they previously did not know the compositional data. They noted that as employers were being required by legislation to inform their employees of chemical hazards there was a necessity for complementary legislation to enable employers to easily obtain the information required.

341. In adddition to the recommendations relating to product safety sheets in Chapter 7, the Committee recommends that:

the Ministers for Health and Employment and Industrial Relations seek the cooperation of the States and the Northern Territory to develop uniform national legislation requiring product safety sheets to be:

- **provided by a supplier where any potential hazards may arise in the transport, storage, use or disposal of a product;**
- **made available to all employees in contact with the product; and**
- **drawn to the attention of employees.**

Protective Measures

342. A number of witnesses advised that hazardous chemical exposure in the workplace can be brought within safe limits in virtually all circumstances by proper engineering controls. It may be that a very small number of chemicals are so dangerous that their manufacture and use may have to be prohibited. In keeping with good practice, the primary method of control should be containment by engineering controls such as enclosed processes, sealed containers, forced-draught ventilation, water sprays or filters to reduce particulate matter. Protective measures such as respirators should only be worn as a last resort or in emergency situations.

343. While engineering controls are central to chemical hazard control in the workplace environment the 1979-80 Annual Report of the Victorian Government's Industrial Hygiene Section observed:

> There is a surprising lack of dissemination of the principles of ventilation and of knowledge of the incorporation of contaminants in air streams. Ventilation engineering is little appreciated throughout the industrial community.

Other witnesses pointed to deficiencies of ventilation systems even of those specially designed for chemical hazard reduction.[102]

344. The necessity of engineering controls is further reinforced by the reluctance of some workers to use protective clothing or respirators provided. Evidence was given that where the effects of a chemical might not become evident for many years or where heat or exertion made their use uncomfortable, this 'macho' attitude was more of a problem.

345. Several witnesses pointed to the aim of a few unions to have safety provisions inserted in awards and to take industrial action to achieve that aim. The adversary system of industrial disputes is not the appropriate way to establish safeguards for chemical use in the workplace. The question of safety, whether physical, chemical or social, should be decided outside the arena of industrial disputation as far as possible. Otherwise safety will be assured to only the strongest unions and denied to the weakest and those not members of unions. This is in addition to the cost of likely disputes to

employees, employers and the community. There is an additional risk that there will be monetary settlements of safety questions rather than removal or control of the hazard.

346. The Committee was concerned at the reluctance of some employers, where hazardous materials are deposited on clothing, to provide a frequent change of overalls and to ensure that work clothes are not taken home where a wider group of people are exposed to the material. These matters are dealt with in the illustrative studies on coke oven emissions and asbestos. There appears to be a lack of clear guidelines and enforcement by health authorities over clothing provision and control as there is over compulsory showering in certain occupational situations.

Occupational Medicine

347. The Director of the United States National Institute for Occupational Safety and Health has said:

> Although the history of occupational diseases extends back for centuries, many of them still go unrecognized today. At the present time, the potential sources of exposure are more numerous than ever. No matter how esoteric the causative agent, the diseases usually manifest themselves in relatively conventional forms. The problem is that the occupational origin is frequently overlooked.[103]

The Department of Health, several professors from faculties of medicine and other witnesses have confirmed that undergraduate medical training in Australia is inadequate in that the possible occupational origins of symptoms are seldom sought in history taking and diagnosis. It would appear that refresher courses and other informal post-graduate training alone cannot make up this deficiency. The failures of diagnoses are a major factor in the under-reporting of occupational disease and the slow development of preventive measures. While health costs are constantly escalating, preventive health measures become increasingly important. Occupational health problems will require more effective management if the World Health Organisation's objective of 'Health for all by the year 2000' is to be attained. The Committee recognises that it is not possible to accommodate the many requests that are made for additional elements in undergraduate medical training. The inadequacies above are major deficiencies and must be rectified as soon as possible.

348. The Committee recommends that:

> **the Minister for Education direct the Tertiary Education Commission in consultation with the Council of Medical Deans to ensure that all undergraduate medical training includes the recognition of occupational causes of disease.**

349. It is not known how many physicians with post graduate qualifications in occupational health there are in Australia. The Commonwealth Institute of Health has for the last eight years been providing a one year postgraduate course for physicians. Approximately 70 doctors have completed this course. The Australian and New Zealand Society of Occupational Medicine estimated that there were no more than 30 doctors employed full time by industry. Professor Ferguson has commented:

> Most occupational medicine is practised outside industry by physicians untrained in the subject . . . Those few occupational health professionals in practice waste much time on fruitless required routines such as medical examinations intended to protect compensation and superannuation funds.[104]

There is as clear a need for more trained occupational physicians as there is for better training of medical practitioners at the undergraduate level.

350. Since 1977 the Commonwealth Institute of Health has offered an annual 13 week course in occupational hygiene. These courses are provided for those in industry

with prior qualifications such as engineers and chemists. Prior to 1977 there were less than five occupational hygienists in Australia. Since 1977 nearly 40 occupational hygienists have been trained at CIH. This is quite a crucial level of training as graduates from these courses are generally employed full-time in the workplace. There is nowhere near enough trained occupational hygienists at present. While on an inspection in Western Australia the Committee was told that one company employed all three of the trained occupational hygienists in Western Australia.

351. While there are a number of nurses working in industry few are trained in occupational nursing. Occupational nurses are able to conduct many assessment, biological monitoring and interview tasks more cost effectively than doctors. Training for occupational nurses appears to have been sporadic in the past.

352. Several witnesses described desirable structures for the provision of occupational health services, these include an occupational physician, occupational hygienist and occupational nurse(s). While some larger workplaces or employers with several workplaces may be able to support their own full-time service more than half of the Australian workforce is employed at workplaces with fewer than 100 employees. Some occupational physicians currently work for a number of companies to provide a full-time occupational health practice. Their employers are larger companies and there remains a need for a method of delivering comprehensive occupational health services to smaller companies. The South Australian Government has experimented with several models of providing these services to smaller employers through community health centres. There have also been private sector initiatives.[105]

353. There is a need for guidelines on the level of services required. One aspect which should be made clear is that these are preventive health services. Most existing workplace health services are oriented toward the treatment of injuries. The latter are still necessary but in the establishment and staffing of occupational health services the provision of preventive services should be emphasised and the training of staff should be in preventive medicine. The World Health Organisation's definition of health is expressed in terms of positive well-being not merely the absence of illness.

354. Clear guidelines are necessary on the circumstances in which pre-placement medical examinations are necessary, the frequency of regular in-service medical examinations or biological monitoring, the nature of medical records to be kept and the length of time they are to be kept. Guidelines on non-medical records of employees are also necessary.

355. While the prior assessment of hazard should be the main preventive mechanism for occupational disease, epidemiological studies are an essential back-up means of detection for those diseases with long periods of latency. The very few health records required to be kept of employees and the length of time for which they are held are of extremely limited epidemiological use. Where workers change employment it is difficult to trace their previous occupations. In the United States, the worker's social service number is used for this purpose and health records are required to be kept by employers for 30 years. Schemes for tracing employees pose problems to privacy. The only obvious equivalent in Australia would appear to be their tax file number.

Chemical Management Training

356. Very few workers and few managers have received formal training on the dangers of chemicals and their safe handling. A number of large companies have recognised that sound occupational health and safety practices are an integral part of

good management practices as they directly affect efficiency and profitability. Unfortunately this awareness has been slow to gain a wider acceptance in industry. Occupational health problems can only be tackled effectively if both management and individual employees are aware of the hazards involved and the appropriate control procedures.

357. The Australian Chemical Industry Council stated, 'Strong management along with sound procedures and proper training is vital in minimising the scope for human error'. It has been suggested that the traditional training of safety officers be broadened to include the assessment of risk from chemical hazards. In the light of evidence received and of UK and Swedish developments, the more formal training of safety personnel from unions and from management is highly desirable.

Workers Compensation

358. Workers compensation provisions around Australia are as fragmented as other occupational health provisions. All States and Territories have legislation which makes some provision for compensation for industrial diseases, usually by defining 'injury' to include occupational disease. The main concerns of the Committee are the necessity of a claimant to establish a causal relationship for chemically induced disease and the restrictions on claiming compensation when a long period has elapsed between the employment and the disease becoming evident.

359. A number of diseases are widely acknowledged as being related to certain occupations and as a consequence many of these have become specified industrial diseases under workers compensation legislation. If a specified industrial disease is contracted then the person becomes automatically entitled to compensation unless it can be proved that the disease was not of occupational origin. The lists of specified diseases varies considerably from State to State and are shown in Appendix 6. The ACT has no specified diseases. Specifying diseases wherever possible is essential. Lists of specified diseases need to be kept up-to-date and comprehensive. An examination of Appendix 6 shows neither to be the case at present. Occupational cancers are poorly covered. For example, vinyl chloride is a well known human occupational carcinogen but is not listed. The effects of chemicals do not vary from State to State but the lists of specified diseases suggest otherwise.

360. It is not clear how restrictive in effect the time or other limits on the making of claims are. Courts appear willing, in applying statutes of limitations, to take as the starting date, the time of the identification of the occupational disease, rather than the time of employment, where these differ. The provisions of some States are more restrictive than others. For example, in Western Australia, compensation is payable for a disease if the worker was employed within one year prior to the date of disablement in employment the nature of which caused the disease. The time limit is lifted only in the case of mesothelioma and pneumoconiosis.

361. Evidence was given that insurers providing workers compensation coverage do not provide adequate incentives for prevention measures but often establish rates on an industry-wide basis. Apart from increasing premiums for those companies with high claim rates, not enough is done to lower claim rates through education and prevention.

362. The Department of Social Security is responsible for workers compensation matters concerning Commonwealth Government employees. The Committee recommends that:

the Minister for Social Security seek the cooperation of the States and the Northern Territory to:

- **prepare model workers' compensation legislation provisions covering occupational disease;**
- **prepare a comprehensive list of specified diseases and machinery for regularly updating them; and**
- **implement uniform national workers compensation legislation covering occupational disease.**

Occupational Health Arrangements in other Countries

363. Occupational health machinery in other countries has in the last decade moved towards having a national body dedicated to occupational safety and health in both federal and unitary government systems. Such bodies are typically responsible for research, collection and dissemination of information, setting of standards including monitoring and for providing or setting guidelines for inspection and enforcement. Some provide training of workplace safety personnel both workers and management. An outline of arrangements in some overseas countries is outlined below.

Sweden

364. Control of toxic substances in Sweden is provided for by the Products Hazardous to Health and Environment Act of 1973. Under this Act it is the responsibility of the manufacturer, importer or seller to prove the safety of a product if there is any suspicion of risk.

365. Sweden has had a national policy on the work environment since the Workers' Protection Act of 1949 and the institution in that year of the National Board of Occupational Safety and Health (NBOSH) which became responsible for the direction, coordination and supervision of occupational safety and health. Under NBOSH a centralised administration of occupational safety and health was achieved by 1972, at first as the responsibility of the Department of Health and Welfare but since 1974 that of the Ministry of Labour.

366. Recommendations of a Work Environment Commission in 1972 and 1976 led to the replacement of the Workers' Protection Act with the Work Environment Act of 1977. This Act provides for the active participation of both workers and employers in occupational safety and health. The Act makes provision for worker safety officers, safeguards their employment and requires that they receive appropriate training. Any workplace with five or more employees must appoint safety delegates from among them. Where there are more than 50 employees, safety committees with employer and worker representatives are required.

367. Basic training courses are provided for safety delegates and for industry supervisors and further courses on a range of safety and health issues such as ventilation and chemical health hazards are also available. In the terms of the Act, the rights and responsibilities of safety delegates include participation in the planning or altering of facilities, equipment or operations, and inspection of relevant documents or seeking information concerning health and safety in the workplace. They are entitled to receive time off with pay for these duties and they may order the suspension of work in cases of immediate and serious danger.

368. In 1976, employers and unions reached agreement on rules and guidelines in relation to work environment activities and the cooperative control and running of company health services. A recent recommendation of the Work Environment Commission was for prior assessment or pre-testing of toxic substances by their producers.

European Economic Community

369. Under the Sixth Amendment to the 1967 Directive issued by the Council of the European Communities relating to the classification, packaging and labelling of dangerous substances, a further draft Directive has set out proposals for the notification of the properties of such substances. In June 1980, the EEC Council of Social Affairs adopted a Directive relating to the protection of workers from harmful exposure to chemical, physical and biological agents at work. This Directive provides a basis for the harmonisation of member state rules and comes into full effect within four years.

370. When member states adopt laws, regulations and administrative provisions concerning a harmful agent, the following prescriptions shall apply:

- limitation of use at the workplace;
- limitation of the number of workers exposed or likely to be exposed;
- prevention by engineering control;
- establishment of limit values (ie exposure limits and/or biological indicator limits), sampling procedures, measuring procedures and procedures for evaluating results;
- suitable working procedures and methods;
- collective protection measures;
- individual protection measures, where harmful exposure cannot reasonably be avoided by other means;
- hygiene measures;
- information for workers on the potential risks of exposure, on technical preventive measures to be observed by the worker, and on the precautions taken by the employer and to be taken by the worker;
- use of warning and safety signs;
- surveillance of the health of workers;
- keeping updated records of exposure levels, lists of workers exposed and medical records;
- emergency procedures for abnormal exposures; and
- if necessary, prohibition of the agents involved, in cases when other means available do not ensure adequate protection.

371. In the case of acrylonitrile, asbestos, arsenic, benzene, cadmium, lead, mercury, nickel and chlorinated hydrocarbons the following additional measures shall be applicable:

- Providing medical surveillance of workers prior to exposure and thereafter at regular intervals. In special cases, a suitable form of health surveillance shall be available to workers after exposure to hazardous agents has ceased.
- Access by workers and/or their safety representatives to the results of exposure measurements, and to the collective results of biological tests.
- Access by each worker to the results of his own biological tests.
- Informing workers and/or their safety representatives where the limit values are exceeded, of the causes thereof and measures taken to rectify the situation; and
- Access by workers and/or their safety representatives to appropriate information to improve their knowledge of the dangers to which they are exposed.[106]

Canada

372. The situation in Canada is similar in many ways to that in Australia, where State governments have the responsibility for the industrial health of workers within their States. In Canada, occupational health and safety are matters for provincial jurisdiction. As yet no uniform approach to health and safety legislation has been achieved. The Province of Saskatchewan Occupational Health Act in 1972 called for a workplace health and safety program based on a worker's right to participate in the identification and control of hazards. Such participation was assured through the requirement that joint health and safety committees with effective mandates be established at all workplaces where ten or more persons were employed. Similar legislation has since been adopted by other provincial jurisdictions, though not all. The Saskatchewan Act defines occupational health as 'the promotion and maintenance of the highest degree of physical, mental and social well-being of workers'.

373. In 1978 the Government of Canada established the Canadian Centre for Occupational Health and Safety. This centre reports to a tripartite board of representatives of labour, management and the federal and provincial governments. Its objectives are to promote workplace health and safety; facilitate consulation and cooperation between the federal and provincial governments and participation by management and labour in the establishment of standards; initiate, evaluate and assist research; and provide advice and information on related matters.

374. The Centre began operations in December 1979. One of its first steps was to establish an Information and Advisory Service which provides information to workers, employers, regulatory agencies and health and safety committees. By the end of 1981 it had responded to about 2 000 requests, most of them for information on chemical substances. The Centre is also developing an automated information system using the ILO data base and other sources, including the United States National Institute for Occupational Safety and Health. The Centre has also carried out secondary research studies on specific subjects for other organisations.

375. In some Provinces, legislation has provided statutory rights of employees to information from their employers on work hazards, results of medical and environmental monitoring, reports of Ministry of Labour inspections, and an annual summary of work place injuries.

376. Some of the provisions already enacted in some Provinces include:

- The requirement to establish joint health and safety committees in workplaces. These committees are given the right to inspect workplaces, to make recommendations to employers and to investigate serious accidents. They are also able to appoint a member to accompany a Ministry of Labour inspector when he enters a workplace;
- The right of individual workers to refuse to work when they consider conditions to be unsafe; and
- The right of workers to know the results of medical surveillance tests when such tests are required to be performed by regulation.

377. Some Provinces have set up councils with employer, employee and government representatives to advise the Minister of Labour of needs and developments affecting health and safety in industry.Trade unions in Canada have prepared intensive courses on occupational health and safety for union officials. In turn, these officials train worker health and safety committee members appointed under recent legislation.

United States

378. The Occupational Safety and Health Act of 1970 sets out general principles to apply to all workplaces and places the onus on employers to provide conditions free from hazards likely to cause death or serious injury. Standards in existence at the time the Act was passed were adopted as law under the Act, but there has been an ongoing program to rationalise or simplify the system by reducing the number of different standards in operation.

379. A National Advisory Committee on Occupational Safety and Health was established under the Act. The Committee has representatives from labour and management and has the responsibility of recommending standards.

380. Union involvement in occupational health and safety includes research, appointments of medical and other professional officers to assist unions, involvement in safety committees and action taken over reported hazards.

381. Legislation to control toxic substances in the United States includes the Toxic Substance Control Act of 1976 (TOSCA) and the Resource Conservation and Recovery Act (RCRA). The provisions of these Acts were covered in paragraphs 45-50 in Chapter 2. Congress has enacted more than 24 regulatory statutes to cover the routes by which certain chemicals or aspects of chemical use can threaten human health and the environment. These laws are administered primarily by the following federal agencies: the Environment Protection Agency, the Consumer Product Safety Commission, the Food and Drug Administration, the Food Safety and Quality Service of the Department of Agriculture, the Occupational Safety and Health Administration and the Department of Transportation.

382. Manufacturers of toxic substances are now required, by law, to keep medical records of their employees for 30 years. For example, under the Act, polychlorinated biphenyls (PCBs) are specifically forbidden to be manufactured or imported.

383. Despite the extensive legislative provisions, administrative problems of shortages of qualified personnel and resources, difficulties in coordinating research and the lack of centralized information have yet to be overcome. The repeated need to focus available resources on urgent toxic chemical problems such as vinyl chloride, PCBs and kepone has compounded the inherent difficulties of identifying and evaluating risks and setting long-term priorities for research and regulation. The US Department of Labor through its Occupational Safety and Health Administration has promulgated a general policy for the identification and regulation of physical and chemical substances that pose occupational carcinogenic risks to humans.

384. The Toxic Substances Strategy Committee, in its 1980 Report to President Carter said:

> The magnitude of the toxic substances control problem, although not quantifiable with precision, is staggering in view of the number of substances whose risk should be evaluated, the rate of growth in both number and volume of chemicals, the various routes by which humans and the environment are exposed, possible synergistic or combined effects of the substances, and the effects that they cause —acute and chronic, immediate and delayed. Years of research can be required to determine whether a particular substance is hazardous.[107]

385. The Toxic Substances Strategy Committee pointed to the need for coordinated chemical data systems to serve the information needs of all agencies. It recommended the completion by the EPA of a chemical use classification system.

United Kingdom

386. The 1972 Report of the Committee on Safety and Health at Work (Robens Committee) led to the enactment in 1974 of the Health and Safety at Work Act which put into effect the Committee's main recommendations.

387. The Act prescribed the general duties and rights of employers, supervisors and workers. It placed a general duty on employers to ensure the health, welfare and safety at work of their employees. The Act covers virtually all workplaces. Employers are required to prepare a company safety policy and to name a manager responsible for information, worker education and the company's health and safety program.

388. Section 6 of the Health and Safety at Work Act prescribes a general duty on any person who manufactures, imports or supplies any substance for use at work:

- to ensure, so far as is reasonably practicable, that the substance is safe and without risks to health when properly used;
- to carry out or arrange for the carrying out of such testing and examination as may be necessary for the performance of this duty; and
- to take such steps as are necessary to ensure that information is available for substances used in the workplace, on the results of any relevant tests and on conditions necessary to ensure that it will be without risks to health when properly used.

389. To discharge this general duty, a manufacturer or importer must satisfy himself that the information obtained from tests and examination gives adequate grounds for a reasonable assessment to be made of the toxic hazard of his material and the appropriate precautions for its handling and use. In an effort to help define the extent of these responsibilities, the Health and Safety Commission (HSC) in the UK drafted a discussion document on a statutory scheme for the notification of the toxic properties of substances. It is proposed that in due course regulations under the Health and Safety at Work Act 1974 will impose a duty on manufacturers and importers to notify the toxic properties of substances they intend to manufacture or import, so as to enable the Health and Safety Executive (HSE) to scrutinise the information being provided. United Kingdom legislation is also required to fulfil the requirements of EEC Directives.

390. Regulations of 1978 gave trade unions the right to appoint safety respresentatives who are required to make formal inspections of the workplace and to make representations to employers about hazards. Safety representatives are entitled to time off with pay during working hours to perform these duties, and to undergo training for this function.

391. Health and Safety inspectors were given power under the 1974 Act to issue improvement and prohibition notices, and substantial penalties were provided for offences under the Act.

392. The Act established the Health and Safety Commission and the Health and Safety Executive to administer its provisions. The Commission is 'independent of Government but responsible to Parliament through the Minister of Employment'. Representatives of both employers and employees serve on the Commission. Duties of the Commission include making proposals for new regulations, promoting research and providing information and advisory services.

393. The Commission has wide powers to compel disclosure of information by employers and, in specified instances, to pass this on to affected parties such as employees. It has broad powers to establish and amend regulations and codes of practice, subject to a formal process of consultation. The Health and Safety Executive

prepares the consultative documents on proposals for regulations and distributes these to interested parties.

394. The Health and Safety Executive is responsible for the coordination of information collection and the centralising of resource information. An ambitious project is the computerisation of this resource information which is being made available through the Prestel communications system. Publication of information and the holding of seminars are some of the activities of the Health and Safety Executive aimed at educating and assisting employers and employees.

395. Toxic substances were of special concern to both the Robens Committee and to the Royal Commission on Environmental Pollution which reported in 1972. At that stage no central agency was responsible for collecting information on toxic substances and many were not covered by statutory provision. The Robens Committee recommended a system of notification of new substances and the setting up of a permanent advisory committee on toxic substances. An advisory committee has been set up by the Health and Safety Commission and the Health and Safety Executive moved to establish a requirement that manufacturers, importers and suppliers should furnish test information to ensure that a substance is not a risk to health when properly used.

Endnotes

88. Para. 2.2.
89. Transcript, p. 2220.
90. Transcript, p. 2220.
91. Speech to Victorian Chamber of Commerce.
92. Annual Report, p. 4.
93. Transcript, p. 626.
94. Community Health Studies, V, 1, 1981 p. 64.
95. Transcript, p. 2509.
96. Transcript, p. 1710.
97. Williams Report, p. 43.
98. Canberra Times, 19 August 1982.
99. Myers Inquiry, p. 451.
100. Regulation 26(1).
101. Regulation 26(2).
102. Transcript, p. 1730-1.
103. Occupational Diseases, A Guide to Their Recognition, US Department of Health, Education and Welfare, June 1977, Foreword.
104. Community Health Studies, V, 1, 1981, p. 65.
105. Transcript, p. 1712.
106. Transcript, p. 2197-9.
107. Toxic Chemicals and Public Protection.

CHAPTER 9

National Occupational Safety and Health Machinery

National Consultative Committee on Occupational Safety and Health

396. As mentioned in the last chapter, it would be imprudent to consider chemical health and safety in the workplace in isolation from the general context of occupational safety and health administration. The present legislative and administrative arrangements for ensuring occupational health and safety are grossly inadequate. The lack of coordination of occupational safety and health matters in the present federal system is a major impediment to the delivery of cost effective occupational health services of a high standard. Following discussions commenced in early 1978 by the Commonwealth, a joint proposal by the South Australian and Tasmanian Governments to the Conference of Commonwealth and State Ministers for Labour, in February 1979, resulted in a review body being set up to examine the feasibility of establishing a national consultative committee on occupational safety and health. Following discussions of the recommendations of the review body by Commonwealth and State Ministers, agreement in principle was given to the proposal to establish a National Consultative Committee on Occupational Safety and Health.

397. The Committee was to comprise two representatives from the State Departments of Labour, two representatives from the State Departments of Health and one representative from each of the Commonwealth Departments of Science and Technology, Health, and Industrial Relations, the Australian Council of Trade Unions and the Confederation of Australian Industry. The latter two bodies endorsed the proposal. The Committee unfortunately did not appear to have representation from the Northern Territory or the ACT. The stated purpose of the Committee was to:

- enable more consultation on principles, practices and standards to take place at a national level;
- promote research (particularly in respect of occupational safety and health problems likely to arise with new equipment, materials, etc); and
- to deal with other matters referred from time to time by the Conferences of State and Commonwealth Health and Labour Ministers.

The Committee was to have no decision making powers but was to report annually to Conferences of Commonwealth and State Labour and Health Ministers.

398. It was envisaged that the Ministers would review the progress of the Committee after two years of operation. The secretariat to the Committee was to be supplied by the Commonwealth from the Working Environment Division of the Department of Science and Technology. Evidence was given by the then Department of Science and Technology that it is Commonwealth policy to attempt to gain uniformity throughout Australia in occupational safety and health arrangements.[108]

399. In April 1980, the Report of the Committee of Inquiry into Technological Change in Australia (Myers Report) made several recommendations concerning the working environment. The Government responded to the Myers Report on 18 September 1980. The relevant recommendations and the Government responses are set out in Appendix 11.

400. The Myers Committee recommended:

- the establishment of a Bureau of the Working Environment advised by a Council having employer and employee representation, and
- active promotion of the establishment of a National Consultative Committee on Occupational Safety and Health.

401. The Commonwealth accepted the recommendations and in April 1981, the Commonwealth Minister for Health was still seeking the views of State Ministers for Health on the establishment of the National Consultative Committee.[109] On 30 April 1981, the Prime Minister announced that as a result of the Review of Commonwealth Functions, the National Consultative Committee on Occupational Safety and Health, despite not being a Commonwealth body, was to be 'abolished'.[110] Despite approaches by the Committee to the Chairman of the Review, the Minister for Science and Technology and the Minister for Industrial Relations, no explanation was given as to how the Commonwealth could abolish such a body. Responses received indicate that no consultations were held with the States or with the other two members of the Consultative Committee before the Commonwealth withdrew the secretariat services it had previously provided.

402. This occurred less than a year after the Commonwealth agreed to 'actively promote' the Consultative Committee. The Review of Commonwealth Functions also led to the halving of the staff numbers in the Working Environment Division, which is now reduced to a branch. Much of the expertise built up within the Division will be lost with the departure of specialist staff. Such specialists are not easy to replace.

403. The reasons given by the Review of Commonwealth Functions for severely curtailing the Commonwealth's contribution to a coordinated national approach to the occupational safety and health problem were not convincing. Particularly when the Commonwealth had recently acknowleged the obvious need to increase that contribution.

404. The Chairman of the Review referred the Committee's request for an explanation to the Minister for Industrial Relations who stated:

> . . . the aims of the Review of Commonwealth Functions (RCF) were to streamline and fine down Commonwealth operations
>
> - partly by withdrawing from functions more appropriately handled by the States or private enterprise; and
> - partly by rationalising the functions which properly belong to the Commonwealth.
>
> With these objectives in mind and also to avoid duplication of effort between the Commonwealth and the private sector and/or the States, the Government accepted recommendations made by RCF that Commonwealth activities in the area of the physical working environment be scaled down, that any residual activities be relocated from the Department of Science and Technology to the Department of Industrial Relations and that the National Committee on Occupational Safety and Health be abolished.
>
> The decision to scale down these functions was based on the Government's belief that responsibility for ensuring the safety and health of persons at work rests primarily with the States. Also so far as the National Consultative Committee on Occupational Safety and Health was concerned there are other Commonwealth/State consultative forums (e.g. Departments of Labour Advisory Committee (DOLAC) and the Conference of Commonwealth/State Labour Ministers) which can provide a means for adequate consultation between the State and Commonwealth on occupational safety and health matters. Also I understand that subsequent to these decisions by the Government the States are considering the establishment of a consultative body to consider occupational safety and health matters with the Commonwealth being invited to participate as a member and that

the matter may be scheduled for discussion at the next Conference of Commonwealth/State Labour Ministers in March 1982.

As well as this, the Confederation of Australian Industry and the ACTU at the October 1981 meeting of the National Labour Consultative Council (NLCC) expressed their interest in the question of occupational safety and health and I agreed with their proposal to establish a standing committee of the Council to examine occupational safety and health matters as they arose.[111]

405. The Committee is not convinced that the coordination of occupational safety and health can be more appropriately handled by the States individually or by private enterprise State Governments have stressed the need for a national approach to hazardous chemical management The Commonwealth has its own constitutional obligations for occupational safety and health which are currently in need of attention The Consultative Committee would have provided a more streamlined approach which is obviously needed Without the Consultative Committee there is certain to be a continuation of the duplication of eort within the Commonwealths own operations and between the States and the private sector This fact is borne out by the remainder of the Ministers letter that indicates that the work of one coordinating committee is to be split up amongst:

- The Departments of Labour Advisory Committee and the Conference of Commonwealth/State Labour Ministers. These two bodies lack health representation and sought the Consultative Committee in the first place.
- A new consultative body proposed by the States to be established to consider occupational safety and health matters with the Commonwealth being invited to participate. This body replicates the very body that the Commonwealth has 'abolished'. It was not clear at the time of the Minister's letter whether the body would have Territory, industry, union or health representation.
- The National Labour Consultative Council is to establish a standing committee to examine occupational safety and health. This includes industry and union representation but lacks health and State and Territory labour departmental representation.

406. The Committee has dealt with this affair in some detail as it illustrates the unhappy state of affairs that exists in the approach to occupational safety and health at the federal level. These problems are great and need to be tackled without further delay. The South Australian Government told the Committee:

> There is a need for a national authority, preferably a single authority having responsibility for occupational and environmental health.

It said such an authority should have a number of functions in addition to the present responsibilities of the National Health and Medical Research Council.[112]

407. It is clear that the Commonwealth needs a clear, positive and comprehensive policy on occupational safety and health. Consequently it needs the appropriate administrative machinery to implement such a policy. Failure in areas of Commonwealth responsibilities are further dealt with in the next chapter. At the national level, appropriate machinery must include State, Territory and Commonwealth health and labour representation together with employer and employee representation on the one body.

408. To ensure that the Commonwealth fulfills its own responsibilities in this area the Committee recommends that:

the Prime Minister appoint a panel of experts to:

- **examine the Commonwealth's overall responsiblities in occupational safety and health, including those of national coordination, and**
- **recommend specific policies and objectives and appropriate administrative machinery to give effect to such policies and objectives.**

National Occupational Safety and Health Organisation

409. Most occupational health problems are common to all States and Territories. The quality of occupational health and safety services in Australia has suffered from the fragmentation of the bodies providing those services and a lack of comprehensive occupational health and safety programs at the national level. Overseas experience has shown the advantages of a national occupational safety and health body and the growing need for one in Australia is quite apparent. The Committee believes occupational safety and health services are most appropriately delivered at the State level but the development of standards, strategies for their implementation and similar common administrative and research requirements are best developed at the national level through a cooperative mechanism.

410. Several departments responsible for occupational safety and health, pointed to the difficulty in keeping up with the flood of information just on chemical hazards alone. Much of this information is from overseas and its volume is likely to increase. Evidence indicated that staffing resources of State occupational health and safety departments are at full stretch, providing the current levels of inspectorate, research and education services.

411. From the Committee's investigation of the occupational control of chemicals it is clear that a national occupational safety and health body is necessary to coordinate legislative and administrative measures across Australia, to make the best use of the limited expertise available and to develop the highest possible standards. The NH & MRC has been largely successful in performing a similar role in medicine but has not been as effective in the occupational safety and health area. It is essential that a national occupational safety and health body develops policies and strategies on a tripartite basis. This is best achieved by having a governing council in a similar way to Canada and the United Kingdom, with equal representation of employers, employees and government. To provide research, administrative and other functions there should be a national office of occupational safety and health responsible to the governing council. The office would be responsible for:

- Research, keeping abreast of new developments, dissemination of information.
- Assessing occupational hazards. This would include assessing new chemicals for their potential hazard in the workplace during manufacture, distribution use or disposal.
- Setting of standards. This would be closely related to the assessment process.
- Occupational health. Develop standards for delivery of occupational health services including pre-placement examinations where necessary, health records, occupational hygiene measures, and health services for small workplaces.
- Monitoring of occupational safety and health. This would include the collection of injury and disease statistics from health records kept by employers and conducting epidemiological studies.

- Training. Promotion of occupational medicine, hygiene and nursing training. Training of occupational safety officers and of safety delegates.

412. Occupational safety and health problems are capable of being well managed but this can only be achieved by a positive commitment by State, Territory and Commonwealth Governments to join with employer and employee organisations to confront the problem together in a cooperative and coordinated way. Such a strategy is necessary if sufficiently high standards are ever to be achieved. By agreeing to develop and adhere to a comprehensive and uniform set of legislation backed by adequate research, assessment, information services, standards development and monitoring machinery, the Committee believes that high standards in occupational safety and health can be achieved at least cost to, and the benefit of, all Australians. These conclusions are supported by the findings of previous inquiries such as those of Robens, Myers and Williams.

413. Evidence was given that employers were increasingly becoming aware that, in addition to moral and legal obligations, sound occupational safety and health management is profitable in the long term. These companies will be assisted by the information services available through a well-run national body. At present these companies have to involve themselves in wasteful duplication in building up information and management programs. There will unfortunately always be those companies which do not feel obliged to meet safety standards or adopt good management practices. Legislation and enforcement backed by substantial penalties are necessary to ensure safe working conditions throughout Australia and to remove the unfair economic advantages that companies ignoring their responsibilities have over companies acting responsibly. Special provisions are necessary to give small employers access to professional services.

414. The Committee recommends that:

- **a national occupational safety and health office be established as a cooperative organisation of Commonwealth, State and Territory Governments;**
- **the office be responsible to a tripartite governing council with equal representation of employers, employees and governments;**
- **national occupational safety and health legislation be drafted by the office for approval by the governing council to be implemented as quickly as possible;**
- **the resultant legislation should be enacted in the first instance by the Commonwealth using its full constitutional powers until such time as individual States have their own comprehensive legislation in place;**
- **such legislation be enforced with substantial penalties for breaches; and**
- **occupational safety and health legislation should be binding on the Crown.**

Such legislation would give the force of law to occupation exposure standards such as those developed by the NH & MRC or the national occupational safety and health bodies. The illustrative studies on asbestos and coke ovens show that such standards are frequently exceeded with inadequate enforcement.

ILO Conventions

415. In the past, Australia has been extremely slow to ratify ILO Conventions including those concerning occupational safety and health. For example Convention 42 on Workmen's Compensation (Occupational Diseases) was adopted by the ILO in 1934 but not ratified by Australia until 1959. Convention 81 on Labour Inspection was

adopted in 1947 but not ratified by Australia until 1975. Convention 139 for the prevention and control of occupational cancer was adopted by the ILO in 1974 but has not been ratified by Australia. A number of important conventions have not been ratified as appropriate international standards are not being observed in Australia.

416. By ratifying a convention a member state accepts an obligation to take all necessary steps to give effect to the provisions of the instrument. The Commonwealth does not ratify ILO conventions until all States have formally agreed to ratification. The delays in ratification are attributed to this process of consultation.

417. The Committee recommends that:

the Commonwealth legislate with a minimum of delay to implement International Labour Organisation conventions on occupational safety and health.

Endnotes

108. Transcript, p. 2210.
109. Transcript, p. 2203.
110. House of Representatives, Hansard, p. 1847.
111. Transcript, pp. 3358–9.
112. Transcript, p. 1684.

CHAPTER 10

Commonwealth Functions

Introduction

418. The Commonwealth has a number of constitutional powers under which it has a clear role in the management of hazardous chemicals, such as international and interstate trade and transport. It is responsible for state-type matters within the ACT and other non-mainland Territories and is responsible for the occupational safety and health of its own employees. There are a number of areas where it shares responsibilities with the States or has a national coordinating role. The Commonwealth is continuing to play an increasing role in coordinating research and legislation on a number of matters among the States and Territories. Membership of international organisations relevant to chemical management is usually at the Commonwealth level.

419. Many areas covered by legislation in the States are not covered in Commonwealth controlled Territories. It will be difficult for the Commonwealth to encourage the States to cooperate with it in providing comprehensive and uniform regulations for the management of chemicals when the Commonwealth lags well behind in its own state-type responsibilities.

Australian Capital Territory

420. The Committee is extremely concerned that in the ACT, where the Commonwealth has state responsibilities, it has neglected them. Much of the basic protective and management legislation of a modern state is not in place. The Territory does not have comprehensive or up-to-date environmental protection legislation. Some of the legislation is 80 years old and is of little relevance to modern hazardous chemical management. The Department of the Capital Territory advised in its first submission that legislation relating to hazardous chemicals had to compete with other legislation and was given low drafting priority.[113] In response to a query from the Committee the Department said:

> The number of industrial establishments using hazardous chemicals in the ACT is low and the need for specific controlling legislation has not been a matter of urgency. Increased industrial activity and policies designed to attract more industry to the ACT are creating conditions under which both industry and the management authorities would function better under the guidance of legislation controlling use and discharge of chemicals. Consequently DCT has initiated work on an Air Pollution (Stationary Sources) Ordinance and a Water Pollution Ordinance which have now higher priority for legislative attention.[114]

421. The Territory lacks legislation to adequately control pesticides, occupational health and safety, air pollution, water pollution, consumer goods and the transport of dangerous goods. The Department of the Capital Territory said that 'By and large this Department would not have any knowledge whatsoever of the amount of chemicals sold, used, disposed of and so on in the Australian Capital Territory'.

422. The Territory does not have legislation to regulate the manufacture, storage, sale, use and disposal of pesticides apart from the limited coverage given by the Poisons Ordinance. Pesticides do not need to be registered to be sold in the ACT Imported pesticides or chemicals with excessive contaminant levels could be sold for any purpose in the ACT, provided the labelling conforms with the Poisons Ordinance—and that

appears poorly policed. Pesticides could be sold to buyers in other parts of Australia as legislation in most States, controls only the sale and not the use of pesticides. Import controls and State legislation do not protect the ACT from such hazards despite the belief of the Department of the Capital Territory.[115] The absence of such basic legislation is unacceptable.

423. Occupational health and safety legislation is restricted to Ordinances governing machinery safeguards, boiler and pressure vessels and lifts and scaffolding. There is no general purpose shops and factories legislation as there is in the States.[116] The Department of the Capital Territory said:

> There have been suggestions made from time to time to introduce a comprehensive factories and shops type piece of legislation in the Territory. It has not received a great deal of priority to date within the Department. The Department has taken the view that there is not a large industrial base in the Territory and that terms and conditions in industrial awards, together with the health aspects being covered by the Capital Territory Health Commission, should cause work to be directed towards higher priority work.[117]

424. There are several serious misconceptions in this statement. Hazardous chemicals are not restricted to industrial workplaces but occur in all kinds of workplaces including service trades, shops and offices. As stated in Chapter 8, industrial awards are not the appropriate mechanism for ensuring occupational safety and health. In any case the Industrial Relations Bureau, as the body responsible for securing the observance of federal awards, was unable to find any reference in awards to measures for the safe handling of hazardous chemicals.[118] Lastly, but far from least, the Capital Territory Health Commission has failed to legislate to enable it to exercise control over occupational health problems. In State jurisdictions, as well as having general occupational safety and health legislation, there are sets of regulations to cover particular hazards such as spray painting, electroplating and confined spaces. The hazards that these regulations are designed to minimise, along with many others, have existed in the ACT for a long time.

425. The Territory lacks adequate air and water pollution control legislation. The Committee discussed this lack of general legislation in paragraphs 202 to 205 of its First Report. The Committee does not believe that the Department of the Capital Territory is fully aware of the extent to which chemicals potentially hazardous to health and the environment are being used or disposed of in the ACT. Shortly after the Committee's First Report was finalised, the Committee inspected the chemical waste facility at the West Belconnen tip. Lists provided to the Committee, of chemicals disposed of at the tip, showed that chemicals which require high-temperature incineration for proper disposal are being buried in drums at the site. This site drains into, and is not far from the Murrumbidgee River. While the quantities of waste involved are small, this is no excuse for improper disposal.

426. The drafting of an ordinance covering Air Pollution (Stationary Sources) and another covering Water Pollution is well advanced and these ordinances should be ready to be introduced shortly. Like all environmental protection, this legislation should bind the Crown. The Committee was concerned by evidence from the Capital Territory Health Commission that it did not monitor stack emissions from its own incinerators for toxic emissions.

427. The Committee recommends that:

the Minister for the Capital Territory introduce the Air Pollution (Stationary Sources) ordinance and the Water Pollution ordinance within six months of the tabling of this Report and that such legislation be binding on the Crown.

428. In the Committee's First Report on Hazardous Chemical Wastes it was critical of the tardiness of the Department of the Capital Territory in incorporating the Australian Code for the Transport of Dangerous Goods by Road and Rail into ACT legislation.[119] Since that Report, there has been a major transport accident in the ACT involving hazardous chemicals. The hazard was unnecessarily increased as the vehicle was not placarded in accordance with the Code. Firemen, not knowing the nature of the load, sprayed water on the burning truck and its cargo, unwittingly exacerbating the situation by releasing toxic fumes. Around 80 people were treated in hospital following the incident. As the Committee said in its First Report, it is irresponsible for authorities to await some tragedy before considering legislation, and its consequent enforcement to be urgent. Authorities have a clear responsibility to anticipate hazards and implement preventive controls. Legislation should prevent disasters rather than constitute a ritual response to them.

429. The Committee recommends that:

the Minister for the Capital Territory introduce legislation adopting the Australian Code for the Transport of Dangerous Goods by Road and Rail within six months of the tabling of this Report.

430. There is at present no product safety legislation in the ACT. The product safety provisions of the Trade Practices Act do not give sufficient coverage as they are meant to complement State consumer protection legislation. Since the Review of Commonwealth Functions, the Trade Practices Commission has been directed to restrict consumer protection action to 'issues of importance at the national level'.[120] An ordinance is proposed authorising investigations of goods, or classes of goods, to make product safety orders and set product safety standards. Once a standard or order is in force it will be an offence to supply goods that are in breach of the standard or order.

431. The Committee recommends that:

the Minister for the Capital Territory introduce the consumer protection ordinance covering product safety matters within six months of the tabling of this Report.

432. The Committee was advised that the *Workers Compensation Ordinance* 1951 is currently being amended so as to cover occupational disease in the same manner as the Compensation (Commonwealth Government Employees) Amendment Act.[121] Comments made on the deficiencies of that legislation are relevant to these proposed amendments.

Public Health

433. The Capital Territory Health Commission is a statutory authority responsible to the Minister for Health and is the health authority for the ACT. The relevant chemicals control legislation administered by the Commission is restricted to: the *Poisons and Dangerous Drugs Ordinance* 1933 and its Regulations, and the *Poison and Narcotic Drugs Ordinance* 1978. These regulate the manufacture, sale, packaging and labelling of substances according to their classification in the National Poisons Schedule.

434. While this legislation provides some effective control over pharmaceuticals, its effectiveness as a general chemical safety mechanism is dubious. The Committee asked what controls existed over four hazardous products selected at random. They were benzene, powdered asbestos, methyl ethyl ketone peroxide and pressure lamp mantles. The Commission advised that there were no controls over asbestos at all or over

pressure lamp mantles. The latter give off unsafe amounts of beryllium fume when first lit. On benzene and methyl ethyl ketone peroxide, the Commission advised that these 'can only be sold by a holder of a licence under the *Poisons and Dangerous Drugs Ordinance* 1933'. The reliance on this Ordinance as a control mechanism is meaningless when the latter substance, at least, can be purchased freely in self-service hardware stores. The warnings required under the Ordinance are inadequate in that they do not stress the need for special cool storage provisions, as the material can become unstable and violently explosive after a period if improperly stored.[122]

435. There is no regulation of carcinogenic or mutagenic substances as such. During inspections around Australia and in evidence, the Committee heard from employers who had prohibited any new uses of asbestos in their plant and who were replacing asbestos based products, wherever possible, with safer substitutes. The Commission merely said that it would give advice on asbestos installations if asked. This is a gross dereliction of duty on the part of the public health authority. The Commission relies heavily on poisons scheduling and the Poisons Ordinances to protect public health from hazardous chemicals. This is clearly an inadequate approach as poisons scheduling is a quite limited exercise. Pesticides and commercial pest controllers are not regulated in the ACT.

436. The approach to hazardous chemicals management in the ACT is to wait until some adverse effect has clearly occurred, rather than to assess likely hazards and to take preventive measures. The Commission relies on general practitioners diagnosing chemically induced illness and drawing it to the Commission's attention[123] before taking action, rather than undertaking preventive programs for known hazards. On the problem of urea formaldehyde foam the Commission said:

> We have had some people complain that there have been various health problems but these were not substantiated or backed up. Their general practitioners did not give them a certificate to the effect that there was a problem here or ask us to monitor the particular house. For that reason the Health Commission has not been involved.[124]

As mentioned earlier, general practitioners are poorly trained to identify chemical causes of illnesses and are frequently unwilling to attribute symptoms to a chemical cause. The NH & MRC has since set the maximum domestic level of formaldehyde gas from all sources at 0.1 ppm. As well as leading to eye and respiratory tract irritation, formaldehyde has been shown to be carcinogenic in animal tests. A number of witnesses have pointed to the failure of public health authorities to take observed adverse chemical effects seriously.

Occupational Health

437. The ACT has no occupational health legislation. (There is a minor exception in that lead poisoning is a notifiable disease.) Consequently, the small occupational health section of the Capital Territory Health Commission offers only an advisory service. It does not have the power to enter workplaces to conduct inspections, relying instead on being invited by employers. It has a staff of three or four to provide services to a workforce of over 100 000.[125] This is barely sufficient for the Commission to look after the occupational health and safety of its own 4000 or so employees. When giving evidence, the Commission did not even know what the size of the Territory workforce was.

438. In addition to having inadequate staffing for providing inspectorial services to the workforce of the Territory, the Commission undertakes some of the supervisory occupational health duties of the Commonwealth to its employees. This compounds the inadequacies of occupational health services in the Territory as not only are services to

the non-public sector further reduced but the occupational health responsibilities of the Commonwealth as an employer must be being neglected in the ACT. It is not clear by what legal mechanism, if any, the Commission undertakes occupational health responsibilities for Commonwealth employees other than its own. The reason given by the Commission[126] was that the Department of Health does not have adequate resources and the work has been delegated by the Director-General of Health. This sad state of affairs is made worse when one also considers the lack of awareness of many Commonwealth Departments of the hazardous nature of products they use.

439. The Commission is ill-equipped to deal with individual occupational hazards on an ad hoc basis, let alone implement an effective preventive occupational health program. The Commission was unaware of a recent workers compensation case in the ACT, known to the Committee, which involved chemicals and which was within the Commission's area of responsibility.

440. A lack of awareness was further illustrated when the Commission was unable to tell the Committee what were the main occupational hazards associated with chemicals in the ACT.[127] The Commission further advised that it has not considered the question of intractable chemical waste because 'it just has not arisen in the past and perhaps since it is a small area of population it is unlikely to arise in the near future'.[128] Intractable chemical wastes are already stored in the ACT.[129] Some are improperly disposed of to landfill at the West Belconnen tip and it is not known how a further significant proportion of chemical wastes is disposed of. The Commission appears unaware that hazardous chemicals exist in a wide variety of products used in the ACT both in workplaces and in the home, and lacks adequate controls to prevent unnecessary injury. The Committee believes that it is quite irresponsible for a public health authority to be so cavalier on known risks to public health such as asbestos, pesticides and solvents and to act only after these known hazards have already caused substantial injury.

441. Commenting on this inadequacy, a Commission witness said of the Commission 'it just has not the resources to devote to an analysis of these new products. I suspect that would be the argument that would come forward from every State health authority also. It would be a massive duplication of effort if each State were to do its own thing. Therefore there has to be some coordinating Federal mechanism'.[130] Such a mechanism would depend on input from States and Territories but the ACT appears at the same time both unable to contribute and lacking adequate advice from the Commonwealth Department of Health.

442. The First Report dealt with the lack of legislation regulating radioactive materials.[131] Research and medical institutional users in the ACT appear to have been identified and safe usage and disposal procedures devised in the absence of legislation. Commercial, industrial and government departmental users appear less well controlled. The Commission has only quite limited information on the present handling, storage, use and disposal of items such as gaseous tritium lighting devices. To claim, as the Commission does, that the proposed ordinance will cover them[132] implies that legislation alone is an effective control mechanism which clearly it is not.

443. Due to legislative and administrative inadequacies, observance in the ACT of ILO Convention No. 42 concerning Workmen's Compensation for Occupational Diseases and No. 81 concerning Labour Inspection (which includes health and welfare) in Industry is inadequate. These Conventions have been ratified by Australia and are binding on the Commonwealth.

444. The Capital Territory Health Commission is expected to provide the same level of services that a State health department does. It is therefore appropriate that it belong

to the relevant national coordinating body. It was made abundantly clear in evidence that the ACT is not represented by the Commonwealth Department of Health on the NH&MRC. Accordingly the Committee recommends that:

the Australian Capital Territory through the Chairman of the Capital Territory Health Commission be a member of the National Health and Medical Research Council.

445. This recommendation will not be relevant if the Government accepts the recommendations of the recent review of the NH&MRC[133] for a smaller governing Council and CTHC representation on a new Board of Public Health.

446. There is no regulation of pesticides in the ACT. The Commission claims it monitors the Poisons legislation aspects such as labelling, warnings, first aid instructions and packaging. However, there is nothing to stop unregistered pesticides or those with excessive contaminant levels being sold in the ACT. No monitoring of pesticides usage is conducted to provide basic epidemiological data.

447. The Committee recommends that:

the Ministers for Health and the Capital Territory introduce, as a matter of urgency, legislation to control the manufacture, sale, use and disposal of pesticides and veterinary chemicals and to license commercial pest control operators in the Australian Capital Territory. The legislation should be binding on the Crown.

448. The Committee further recommends that:

the Ministers for Health and the Capital Territory introduce, as a matter of urgency, legislation and appropriate administrative measures to safeguard occupational safety and health in workplaces in the Australian Capital Territory. The legislation should be binding on the Crown.

Occupational Health of Commonwealth Employees

449. The Commonwealth, through government departments and authorities, is the largest single employer in Australia. The Commonwealth is the employer of many people using hazardous chemicals in their employment and is the purchaser of many products containing hazardous chemicals. Commonwealth authorities and their workplaces are exempt from State occupational health and safety legislation. State government officers may make inspections on invitation from the Commonwealth authority involved. The occupational health authority for the Commonwealth is the Director-General of Health. Occupational safety and health provisions are covered by the *Code of General Principles on Occupational Safety and Health in Australian Government Employment*. The health aspects of the Code and their requirements are determined by the Director-General of Health, while safety aspects are determined by the Working Environment Branch of the Department of Employment and Industrial Relations. The Code of General Principles is intended to be supported by Codes of Practice, which recommend good practice in particular subjects such as spray painting, electroplating and welding.

450. The Code of General Principles was adopted by the Commonwealth in September 1974 and reaffirmed in May 1978. A copy of the Code is at Appendix 8. The list of Codes of Practice relevant to occupational health produced to date, which is at Appendix 9a, is far from comprehensive and is particularly lacking in its coverage of chemical hazards. The Occupational Health Guides of the NH & MRC that have been Gazetted to have effect in Commonwealth employment, which is at Appendix 9b, is also far from comprehensive.

451. Evidence was given by the Department of Science and Technology that the Code of General Principles is required by Executive decision to be observed by all Ministers in respect of their departments and authorities.[134] This obligation has existed since 10 September 1974. Evidence from other departments indicates that most appear unaware of the Code and its implications, particularly the requirement to establish health and safety committees, safety coordinators and workforce safety officers. The lack of relevant Codes of Practice may contribute to this lack of awareness. The ACTU claimed that in a recent audit, only 40 percent of departments were implementing the Code.

452. The Code of General Principles was prepared by the Committee on Occupational Safety and Health in Commonwealth Government Employment (COSH), which was established in 1973. The Committee was chaired by the then Department of Science and Technology and had representatives from: Department of Health; Department of Housing and Construction; Public Service Board; Australian Postal Commission; Australian Telecommunications Commission; Australian Council of Trade Unions; Council of Australian Government Employee Organisations and the Chief Inspectors of State Departments of Labour. Detailed provisions under the Code were prepared by the Committee from time to time and approved as Codes of Practice by the relevant Minister.

453. The Committee was abolished by the Review of Government Functions. The abolition does not assist in achieving any of the stated objectives of the Review as set out in Chapter 9.[135] The development and implementation of a comprehensive set of Codes of Practice has been extremely slow. In the eight years since the Code of General Principles was adopted, 41 Codes of Practice have been developed with few of these having direct relevance to chemical health. The halving of the size of the Working Environment Division, now a Branch, will further delay preparation of the necessary Codes. The abolition of COSH will reduce the access to expertise from outside bodies and reduce the current low level of coordination of occupational safety and health management amongst Commonwealth agencies.

454. The area of the Department of Health responsible for preparing codes covering occupational health matters is the Social Health Branch of the Public Health Division, which has an Occupational Health Section with a staff of four. The functions of the Occupational Health Section are to:

- plan and develop occupational health standards for Commonwealth Government employees;
- provide comprehensive advisory and consultative services on occupational health to Commonwealth Government departments and statutory authorities in particular and for industry and the workforce in general; and
- assist relevant Committees of the NH & MRC.[136]

In addition to these four, who do not have medical qualifications, there is a Medical Services Adviser in Occupational Health.

455. The foreward to the Code of General Principles states:

> . . . the Code provides not only for the control of the physical environment, but for training, consultation between management and employees, and their maximum involvement in all accident prevention measures.

These laudable objectives cannot be achieved if the Code is not fully implemented. It is unacceptable that Commonwealth employment should lag behind the standards of other employers in occupational safety and health.

Statistics

456. In keeping with the low overall priority given to occupational safety and health in Commonwealth employment, reliable statistics are not available on time lost due to occupational injury or disease in Commonwealth employment. It is expected that statistics on occupational injury will be fully collected in the year 1982-83. If section 13.2 of the Code of General Principles had been observed since 1974, by all of the departments and authorities bound by it, statistics would already be available.

Workers' Compensation

457. The *Compensation (Commonwealth Government Employees) Act 1971* provides compensation for occupational disease. The Regulations to the Act specify types of work that are deemed to have contributed to certain diseases. These are shown in Appendix 6. Diseases not specified in the Regulations may be compensable if the employee can establish that the disease is more frequent in the type of work involved. The Committee notes that occupational carcinogens are not well covered in the schedule of specified diseases. The Committee believes that a more comprehensive and up-to-date list should be developed, preferably as part of a national model code for workers compensation for occupational disease.

Purchasing

458. The Committee discussed product safety sheets in Chapters 7 and 8. A number of responsible employers in industry and public utilities require suppliers to provide product safety sheets for materials they purchase so that the health of their employees can be protected. The Committee is aware only of a few Commonwealth departments which do this. The Department of Science and Technology observed:

> Lack of readily available information on chemicals hampers the implementation of the Code of General Principles, for example, many of the chemicals being used have been given trade names only, and no statutory arrangements exist for manufacturers or suppliers in Australia to disclose the chemical composition of their products to subsequent users. Even when information on the chemical composition can be obtained, this does not necessarily mean that the toxicological properties of a substance can be reliably deduced from such information.[137]

459. It is clear from evidence received that most Commonwealth departments and authorities are unaware of the potential health hazards of materials they purchase for use by employees. For example, the Australian Government Publishing Service advised that it relied on the user reading and following precautions printed on the label.[138] Labels are frequently quite inadequate for occupational health purposes and quite a number of printing materials are potentially hazardous.

460. The Department of Administrative Services is the purchasing authority for the Commonwealth and purchases common-use items and acts as agent in the purchase of goods and services valued over $10 000 at the request of the purchasing department or authority. The Department does not undertake purchasing for all Commonwealth agencies and there are major exceptions. The Department is, however, responsible for Commonwealth-wide purchasing policy. The Committee recommended in Chapter 7 that it be a standard condition of Commonwealth purchasing that if a product contains potentially hazardous chemicals, product safety sheets be provided in sufficient quantities for each workplace where it is to be used.

Transport and emergency situations

461. The Commonwealth Fire Board 'noted the absence of uniform and properly publicised safety practices in Australia and is concerned at the position'.[139] It went on to say that the Hazchem system of labelling 'should cover dangerous goods in transit as well as the handling and storage of chemicals in factories, warehouses and other locations'.[140] Most fire brigades in Australia are already familiar with the Hazchem code and have issued firemen with cards but the Commonwealth Fire Board has not implemented any program to ensure Commonwealth facilities and vehicles are labelled in accordance with the Code. Similarly, while the Department of Administrative Services is represented on the Advisory Committee for the Transport of Dangerous Goods it has not, in its own operations, implemented the Australian Code developed by ACTDG and gazetted in December 1980. The Australian Chemical Industry Council advised that its members had voluntarily adopted the Code nationally rather than wait for each of the States and Territories to incorporate the Code in legislation. It appears that some Commonwealth authorities have failed to implement the best available practices when they are readily available and when other Commonwealth departments have been endeavouring to gain their adoption throughout Australia. This is another instance where legislation clearly needs to be binding on the Crown.

Import and Export Controls

462. The exercise of import controls through the Customs (Prohibited Imports) Regulations is fairly limited. In the five years prior to 1981, twenty goods or sets of goods were made prohibited imports for safety reasons. Of these, seven related to toxic effects. In administering the customs legislation, customs authorities rely on other policy departments such as Health, and Home Affairs and Environment notifying them of the dangerous nature of particular imports and seeking import controls. Since 1970 all importations of therapeutic substances have required approval from the Director-General of Health.

463. Customs legislation is effective only at the point of importation and does not extend beyond that. Because of the wider application of the Trade Practices Act, the Department of Business and Consumer Affairs advised that when a product was gazetted under the Customs (Prohibited Imports) Regulations it was invariably covered by regulation under the Trade Practices Act as well.

464. The Consumer Product Safety Commission of the United States advises Australian trade practices authorities when any consumer products subject to a safety ban are exported from the United States to Australia. There was a proposal that all exports be covered by a similar notification scheme but this was rejected by the Reagan Administration. Australia is also participating in an OECD informal notification scheme whereby new regulations of specific consumer goods by member countries are notified to other members.[141]

465. Australia does not exercise any control over the export of hazardous substances per se. In fact, the Trade Practices Act excludes coverage of goods for export. The Committee believes that if a substance is subject to regulation within Australia because of its hazard, countries to which those materials are exported should be notified if Australia is to play its part as a responsible member of the world community.

Trade Practices Act

466. Section 62 of the Trade Practices Act enables the responsible Minister to declare safety standards for consumer products which are 'reasonably necessary to prevent or

reduce risk of injury to persons using the goods or to any other persons'. It also provides for the banning of unsafe goods from supply if those goods 'will or may cause injury to persons using the goods or to any other persons'. At the time evidence was given to the Committee by the Department, ten Consumer Product Safety Standards had been declared, only one of which related to a chemical hazard (the flame retardant TRIS for fabrics, due to its carcinogenicity and mutagenicity). At the same time, twelve goods or classes of goods had been banned as unsafe goods, three of which were due to chemical hazards.

467. The Commonwealth legislation is complemented by some State and Territory legislation. The sale of unsafe goods can be banned in New South Wales, Tasmania, Western Australia and the Northern Territory. Action initiated by State authorities can, where appropriate, lead to Commonwealth action. The Committee believes that greater use should be made of the Act to control chemical hazards and has made recommendations earlier in the Report.

Responsibility of a Federal Government

468. In addition to the Commonwealth powers discussed above there remain several important constitutional responsibilities. One of the biggest single problems in hazardous chemicals management is the fragmentation of legislative, administrative, research and assessment efforts around Australia. Evidence before the Inquiry shows beyond any doubt that effective assessment and control machinery requires a well coordinated national approach with considerable reliance on effective machinery in other countries and at the international level. The Committee believes the Implied Power to be an important one in connection with the problems raised by the present Inquiry. With this power must go an equivalent responsibility on the part of the Government which exercises it.

469. An earlier opinion from the Attorney-General's Department described the Implied Power thus:

> The Constitution by creating the Commonwealth as a nation state thereby implies in it a power to do those things which are incidental to its status as such and to the exercise of the functions of a national government. 'These are things which, whether in reference to the external or internal concerns of government, should be interpreted widely and applied according to no narrow conception of the functions of the central government of a country in the world of to-day' (per Dixon J. in *Attorney-General (Vic.)* v. *The Commonwealth* (1945) 71 C.L.R. 237 at 269).
>
> Mason J. touched on this question in his judgment in Victoria v. Commonwealth and Hayden (1975) 134 C.L.R. 338 at 397. He said:
>
> > . . . in my opinion there is to be deduced from the existence and character of the Commonwealth as a national government and from the presence of sections 51(xxxix) and 61 a capacity to engage in enterprises and activities peculiarly adapted to the government of a nation and which cannot otherwise be carried on for the benefit of the nation . . . the Commonwealth may expend money on enquiries, investigations and advocacy in relation to matters affecting public health, notwithstanding the absence of a specific legislative power other than quarantine. . . . No doubt there are other enterprises and activities appropriate to a national government which may be undertaken by the Commonwealth on behalf of the nation. The functions appropriate and adapted to a national government will vary from time to time. As time enfolds, as circumstances and conditions alter, it will transpire that particular enterprises and activities will be undertaken, if they are to be undertaken at all, by the national government'.
>
> In the same case similar observations were made by Jacobs J. (at 412-413).

470. The Committee believes that hazardous chemical problems are capable of management. This can only be achieved by a positive commitment by State, Territory and Commonwealth Governments to join together and confront the problems head-on. By agreeing to develop and adhere to a comprehensive and uniform set of legislation backed by adequate research, assessment, information services, standards development and monitoring machinery, the Committee believes that the biggest obstacle to the safe management of chemicals in Australia will be overcome. The role of the Commonwealth as the national government is to coordinate control machinery and technical resources and to lead in the standard setting process. In the making of uniform legislation there are several alternatives:

(a) The first alternative is for cooperative bodies representing State, Territory and Commonwealth Governments, possibly in conjunction with several relevant non-government organisations, to pool their research and administrative resources to develop model legislation, codes of practice, standards, etc. acceptable to all and then either:

(i) recommend them to member governments which then adopt them into legislation if and to the extent they see fit. This is the model that the NH&MRC and the AAC conform to. Model legislation and standards are frequently slow to be adopted, adoption being staggered over a number of years and when adopted are not always adopted uniformly. While the mechanism does avoid unnecessary duplication and lends itself to uniformity, uniformity is not always the result; or

(ii) have the substance of model legislation or codes of practice issued in a formal way such as publication in the Commonwealth Gazette and then adopted by reference to the gazetted code in State or Territory legislation. This is the model adhered to by the Australian Code for the Transport of Dangerous Goods by Road and Rail. It allows uniform legislation which, once in place, can be updated uniformly and quickly by revised gazettals at regular intervals.

(b) The other alternative is for the Commonwealth to legislate to the full extent of its constitutional power. The International and Interstate Trade Powers, sec. 51(i) and the Corporations Power, sec. 51(xx), if exercised in conjunction with the Territories, External Affairs, Implied and other powers granted under the Constitution would cover a wide range of activities involving hazardous chemicals.

471. As Professor Sawer succinctly stated in a legal opinion on waste disposal powers provided to the Committee and included as Appendix VII of the First Report:

> The Corporations Power has the advantage of applying to both intrastate and interstate transactions and the disadvantage of not applying to individual or partnership as distinct from corporate activity. The Interstate Trade Power has the advantage of applying to all persons, natural and corporate, and the disadvantage of not applying to interstate activities.

472. The Committee believes that full use of the powers available to the Commonwealth could cover, with the exception of State Government departments, virtually all of the areas of concern to the Committee. These would include notification assessment, registration, labelling and consumer protection through to disclosure of product information, and occupational health. Australia at present is well behind other industrialised countries in the regulation of hazardous chemicals.

473. The Committee recommends that:

if State Governments fail to introduce effective and comprehensive legislation and administrative machinery for the regulation of chemical hazards by 1985, the

Commonwealth legislate to control these hazards to the fullest extent of its power.

474. Many of the provisions recommended in this Report will cost money and, in the present economic climate, governments and companies will claim that they cannot be afforded. The Committee makes several observations on such claims. The costs of prevention are far less than the costs to health of chemical accidents and disease. These costs already exist in the community and must be reduced as soon as possible. A commitment by governments, employers and unions must be made now as it will take quite a number of years to fully implement sound and comprehensive machinery to ensure chemical health and safety.

Endnotes

113. Transcript, p. 3119.
114. Transcript, p. 3130.
115. Transcript, p. 3117.
116. Transcript, p. 3168.
117. Transcript, p. 3170.
118. Transcript, p. 2230.
119. Paragraphs 206-208.
120. Annual Report 1981-82, p. 15.
121. Transcript, p. 3154.
122. Transcript, p. 1724.
123. Transcript, pp. 3207 and 3218.
124. Transcript, p. 3207.
125. Australian Bureau of Statistics: *Total population employed, 1980.*
126. Transcript, p. 3198.
127. Transcript, p. 3205.
128. Transcript, p. 3216.
129. Transcript, p. 3162.
130. Transcript, p. 3208.
131. Paragraphs, 211-214.
132. Transcript, p. 3216.
133. The National Health and Medical Research Council: A Review of its Functions, Structure and Operations, Report to the Minister for Health, J. Coghlan and B. J. Shea, June 1982, Recommendations 12, 13 and 15.
134. Transcript, p. 2227.
135. Transcript, p. 3358.
136. Letter from Acting Minister for Health dated 24 September 1981.
137. Transcript, p. 2193.
138. Transcript, p. 3275.
139. Transcript, p. 3270.
140. Transcript, p. 3271.
141. Transcript, p. 3339.

Illustrative Studies

Asbestos

Coke Oven Emissions

Lead

2,4-D and 2,4,5-T

CHAPTER 11

Asbestos

Characteristics and Use

475. Asbestos is a broad term embracing a group of fibrous silicate minerals with a crystalline structure, the most common of which are chrysotile (white), crocidolite (blue), amosite (brown) and anthophyllite (white). Asbestos fibres have high tensile strength, form effective electrical insulation and are resistant to abrasion, high temperatures and chemical attack. Asbestos therefore, has had a wide range of industrial applications with over 2 000 distinct uses. In Australia 85 per cent of asbestos currently used in manufacture is chrysotile, the remaining 15 per cent is amosite. The other types of asbestos are of no present commercial significance, although significant quantities of crocidolite remain in various installations and exposure can still occur.

476. Asbestos may be used alone or combined with other materials. Its presence, especially when compounded, may be concealed by the use of trade names.

Exposure

477. Exposure to asbestos dust occurs during the mining and milling processes, in the manufacture of items such as textiles (cloth, padding), cement products (sheets, pipes), friction materials (clutch plates, brake linings) and insulation products (pipe and boiler insulation), in the spray insulation of new constructions, in shipbuilding, in the repair and demolition of ships and buildings, in the use, machining or removal of products containing asbestos and in waste disposal.

478. Exposure to asbestos dust occurs particularly when dust-forming operations, such as the opening of bags, or handling, sawing, teasing, grinding, drilling, turning etc., are performed upon materials containing asbestos in which the asbestos is not treated or bonded into the material. The application of asbestos insulation materials by spraying and the removal of old asbestos insulation are important sources of exposure.

479. People not only inhale asbestos, they drink it in water and beverages, such as wine and spirits and they eat it in food. It gets into water from natural outcrops of asbestos, from tailings at asbestos mines, from asbestos wastes and, in minute amounts, from asbestos-cement roofs and water pipes. It gets into beverages and foods through the use of asbestos filters and from atmospheric fall-out.

Asbestosis

480. Pneumoconiosis is the generic term covering a group of dust diseases of the lungs in which the main individual diseases are coalworkers' pneumoconiosis (black lung), silicosis and asbestosis. Pneumoconiosis is caused by the inhalation of a variety of industrial dusts, but the mere accumulation of dust in the lungs is not considered in itself to be a disease. This is not regarded as occurring until there are irreversible pathological changes in the lung tissues called fibrosis, which is the laying down of fibrous tissue in the lung.

481. Following inhalation, usually over a number of years, of substantial amounts of asbestos dust, asbestosis may occur, usually over a further period of years and is not dependent on further exposure. There are individual variations in susceptibility to the disease.[142]

482. Pulmonary asbestosis primarily affects the lung tissue within the sponge of the lung itself —usually in the lower part of the lung. It progresses to cause diffuse crippling fibrosis of the lung. This crippling affect results from the thickening of the membrane lining and tissue surrounding the air sacs within the lung, which restricts the exchange of gases i.e., oxygen for carbon dioxide. Such diminished gas diffusion may be noticed well before any changes can be seen on a chest x-ray. Not only do these areas of the lung become sources of secondary infection but the useful area of the lung progressively decreases.

Lung Cancer

483. In addition to asbestosis, exposure to asbestos dust is associated with an increased risk of two malignant conditions, lung cancer and mesothelioma. Asbestos-exposed workers who smoke are particularly prone to develop lung cancer. These cancers are malignant. If diagnosed early they may be totally removed, but commonly the outlook is poor. The latent period, which is the elapsed time between the date of first exposure and the tumour diagnosis, is usually of the order of 25 years and may be 30 years or more.[143]

484. The view of Professor I.J. Selikoff of the Mount Sinai School of Medicine in New York, which is now widely accepted, is that the effect of smoking on asbestos exposure is multiplicative, not merely additive. It is generally accepted by health authorities that lung cancer is much more likely to occur in a smoker exposed to asbestos dust, than in a similarly exposed non-smoker. The risk of a smoker contracting lung cancer is, in any event, high and substantially increases if the smoker works, or has worked with asbestos. Some studies have indicated that a majority of heavy-smoking, highly-exposed asbestos workers may eventually develop the disease.[144] There is now some evidence that for non-smokers exposed to asbestos dust for long periods, there may be an incidence of lung cancer slightly higher than that for the general non-smoking population.[145]

485. As with other carcinogens, there is no level of exposure that can be described as safe. There is a dose-response relationship such that increased exposure causes an increase in the incidence of the tumour.[146] Therefore where asbestosis is present, the risk of lung cancer is increased significantly. It has been shown that, in the less exposed group, asbestos workers who smoke and have not developed asbestosis are more prone to lung cancer than the general population. (NH & MRC 1981).

486. There is an excess of lung cancer in asbestos workers who smoke, produced by all types of asbestos.

Mesothelioma

487. Mesothelioma has been listed as a prescribed disease for workers compensation since August 1966 and is defined as a primary malignant neoplasm of the pleura or of the peritoneum.[147] When this condition arises, life expectancy is no more than one to three years and can be appreciably less. There is a long latent period between first exposure and the appearance of the tumour. On average it is between 20 to 50 years and rarely under 10 years.

488. The level of exposure sufficient to produce mesothelioma has not been established but it is clear that the total number of asbestos fibres remaining in the lung is a prominent factor in causation. Studies have shown that increasing exposure to asbestos induces a larger number of cases of mesothelioma.[148] Mesothelioma can be induced by relatively short term exposure to high concentrations, or by smaller

intermittent doses over a long period. Low exposure for short periods, as a cause of the eventual production of mesothelioma, remains a question. There have been several descriptions of alleged cases quoted in medical literature.[149]

489. There is a 'background' incidence of mesothelioma in the general population with asbestos being the only known cause. There is evidence that a proportion (one source has stated it to be as high as 20 per cent) of cases of mesothelioma have no known occupational association with exposure to asbestos dust. Asbestos is so widespread that it is doubtful that anyone has not been exposed to at least a few fibres.

490. There is evidence that most types of asbestos may be responsible for the production of mesothelioma, although it seems that the risk is greatest with crocidolite, much less with amosite, less again with chrysotile and less still with anthophyllite. This last type has never been shown to induce mesothelioma. There is no known association with tobacco smoking.[150]

Peritoneal Mesothelioma

491. These tumours are associated with the occupational inhalation of asbestos. Their incidence is less than that of pleural mesothelioma. The greatest risk appears to be related to inhalation of crocidolite fibres but at least one opinion has been expressed that chrysotile may tend to produce peritoneal tumours.[151] The peritoneum is a membrane around the outside of the coils of the intestine, and also lining the abdominal cavity. It is similar in character and thickness to the pleura.

492. The best proof of mesothelioma comes from pathological examination of post-mortem material, but many suspect cases never go to autopsy. There is a strong suspicion that this cancer, and particularly peritoneal mesothelioma, is considerably under-reported in Australia.[152]

Cancer of the Bowel

493. Peritoneal mesothelioma is excluded under this heading. It covers tumours occuring on the inside lining (epithelium) of the intestines. Several studies have suggested a possible increased risk of this tumour in occupationally exposed asbestos workers. The suggested increase is approximately two to three times the otherwise expected incidence but the relationship is not yet clearly established.

494. The effect of cigarette smoking is not clear. It appears evident that bowel cancer may be related to the inhalation of asbestos fibres and not to their being swallowed in food or drink.[153]

495. The question of what minimum exposure to asbestos will cause cancer and, in particular, mesothelioma, naturally arises. There is probably no single answer to the question since individuals vary in their susceptibility to asbestos, as they do to other carcinogens or cancer-producing agents. A dose tolerable in one person may cause cancer in another. Dr Alan Crawford, of the division of Occupational Health in the Health Commission of New South Wales says that, as with other carcinogens, it is not possible to specify a safe level of exposure to asbestos fibre.[154] The NSW Dust Diseases Board accepted as a disability for compensation the mesothelioma suffered by a factory worker whose only contact with asbestos was the regular wearing of asbestos gloves to handle hot tools.[155]

496. A better understanding of the nature, incidence and causes of mesothelioma is expected from the establishment of the national mesothelioma registry, a move made with the backing of the Royal Australian College of Pathologists. The confirmation and

documenting of all cases of mesothelioma by a registry should settle the earlier-mentioned suspicion that the cancer is considerably under-reported in Australia.

History of Asbestos-Related Diseases

497. The relationship between asbestos and pulmonary scarring was first recognised early this century but acceptance of the pathogenicity of asbestos has been slow.

498. As early as 1918, the Prudential Insurance Company in Boston was persuaded not to issue policies on asbestos workers due to the probable harmful effect of asbestos dust. In 1930, Merewether and Price presented a report to the British Parliament establishing 'the fact that the inhalation of asbestos dust over a period of years results in the development of a serious type of fibrosis of the lungs', and indicated that the remedy would be in dust suppression. Three papers, appearing almost simultaneously in 1930, made the first reports of cases of asbestosis in the United States.[156]

499. In 1931, Klemperer and Robin published an account of five primary neoplasms of the pleura, although they did not clearly establish the relationship with asbestos exposure.[157] In 1960-61, Wagner and his colleagues in South Africa firmly established the existence of mesothelioma and announced that in the previous four years they had seen 33 histologically proven cases of mesothelioma of the pleura, and that 28 of these had some association with the Cape asbestos field and four had been exposed to asbestos in industry. Wagner went on to demonstrate the experimental development of pleural mesotheliomatous tumours by the intrapleural injection both of chrysotile and of crocidolite (1962). At the International Congress on Occupational Health in 1963, he was able to report on more than 120 cases seen since 1956. More than half of the cases had never worked in the asbestos industry but lived in the vicinity of mines and mills, and the importance of neighbourhood exposure was thereby established.

500. In May 1935, Lynch and Smith published the first report of lung carcinoma in a man with 'asbestos-silicosis' who had worked for 21 years as an asbestos mill weaver. The authors did no more than draw attention to the coexistence of the two diseases. In 1955 Doll, reporting on all of the coroner's necropsies since 1935, on persons known to have been employed at a large asbestos works, concluded from the data that lung cancer was a specific industrial hazard of certain asbestos workers and that the average risk among men employed 20 or more years had been ten times that experienced by the general population. Also, during the fifties, Irving Selikoff, of Mount Sinai Hospital in New York, carried out studies based on union records of asbestos workers in the United States. Conflicting evidence prior to 1958 was resolved in the immediately succeeding years through better epidemiological techniques and an understanding of the long time interval required, following initial exposure, before definite conclusions could be drawn about the prevalence of cancer. We now know that much of the negative evidence stemmed from conclusions drawn prematurely, before the slow processes of carcinogenesis had had a chance to become evident.[158]

Standards and Legislation

501. In the early 1930s, the United Kingdom recognised asbestos as being injurious to health and introduced regulations to control its use. These required exhaust fans to be provided for certain operations and prohibited other operations from being carried out by hand. In recent decades, a considerable amount of research has been undertaken worldwide. The safety standards which are operative throughout the world vary. As more knowledge has become available on the health aspects of asbestos exposure, the controls surrounding its mining and use have become more stringent. There is no set level of air contamination which can be stated to be being absolutely safe. The degree of

hazards depends not only on the level of contamination but the length of time a person is exposed, his physical condition, tobacco smoking habits and the characteristics of the fibres which are inhaled.

502. In the 50 years since some of the major asbestos hazards were recognised, the system of self-regulation and voluntary standards supported by advice and pressure from the State Departments of Labour, Mines and Health, has left an unacceptably high toll of asbestos-induced diseases and deaths. Industry's contribution to the reduction of health hazards under this system has been inadequate.

503. The most dramatic illustration is Australia's single blue asbestos (crocidolite) mine at Wittenoom in Western Australia, which in 1943 was taken over and operated for 23 years by CSR, operating through its wholly owned subsidiary Australian Blue Asbestos Ltd. Of 6 000 people that CSR claims worked at Wittenoom, over 200 have died from asbestos-related diseases—one in every 30—and this is likely to rise, given the long period between exposure and manifestation of these diseases.

504. CSR now maintains that there was not enough evidence at the time to prove a special danger beyond doubt. Whether this is so or not, there were certainly ample grounds for the gravest suspicion and there is no doubt that it was persistently told by the Health Commission that there was insufficient control of dust levels to prevent asbestosis. The Department of Health in Western Australia first expressed its concern about dust in Wittenoom in 1948. In 1959, the Department's Annual Report drew attention to the number of men affected by asbestos caused diseases. The present Director of Public Health in Western Australia described the dust levels as being far above any 'acceptable level of safety' and in 1960 he diagnosed the first case of mesothelioma and explained its significance to the management of the mine.

505. Pressure was brought to bear on the management of the mine both by the Health Department and the Mines Department. In 1961, in a confidential letter to the Under-secretary of Mines, Dr McNulty wrote: 'It would appear that repeated advice and warnings of the health hazard from dust have been ineffective and that strong action will have to be taken'. The Mines Department twice threatened to close down the mine but these were empty threats since neither the Health Department nor the Mines Department had—or still have—the authority to close the mine, no matter how dangerously it was being run.

506. There are, in general, no dramatic work-stopping agents associated with asbestos-related diseases and industry would achieve negligible savings in production time by reducing their incidence. The benefits of reduced workers compensation premiums and tort claims has, until recently, been negligible and therefore, the total economic benefits to an employer of reducing asbestos hazards are minimal, as is the case for a wide range of occupational diseases. Recently the Johns Mansville subsidiary of the giant Johns Corporation in the United States has sought to alter its structure to avoid the mounting liability of asbestos damages claims. In this instance it would appear necessary that legal standards be created and enforced in such a way that it is unprofitable to violate them.

507. It has taken a long time for authorities in Australia to introduce regulations to control the hazards of asbestos. Regulations relating to asbestos currently in force in the States are:

N.S.W. . .	Factories, Shops and Industries Act, 1962. Factories (Health and Safety—Asbestos Processes) Regulations (effective from 1 February, 1978)
Vic. . . .	Labour and Industry Act, 1958 Labour and Industry (Asbestos) Regulations, 1978 (effective from 19 December, 1978)

S.A. . . .	Industrial Safety Health and Welfare Act, 1972. Industrial Safety Code Regulations, 1975, Regulations, 1975, Regulation 39 (effective from 1 September, 1976) Construction Safety Regulations (Regulation 161A)
W.A. . . .	Factories and Shops Act, 1963. Asbestos Regulations 1978 (effective from 25 August 1978)
Qld. . . .	Factories and Shops Act, 1960. The Asbestos Rule (Rule 9) (effective from 11 July, 1971)
Tas. . . .	Industrial Safety, Health and Welfare Act, 1977. Administrative and General Regulations, 1979 (effective from 24 April, 1979), (Attachment 1).

The ACT lacks any legislative control over asbestos.

508. Queensland became the first State to introduce an 'asbestos rule', in July 1971. This imposes duties on the occupier to give notice to the Chief Inspector of Factories and Shops that he is undertaking a process involving asbestos, and requires him to provide exhaust ventilation which prevents the entry of asbestos dust into the air of any workplace, or, where this is impracticable, to provide effective screening, approved respiratory equipment and protective clothing. There are further obligations to keep the premises and plant clean, and on employed persons to wear and appropriately store, protective equipment supplied.

509. The South Australian and New South Wales regulations, which took effect in September 1976 and February 1978 respectively, are similar to that of Queensland, although the New South Wales regulation is broader. It obliges factory occupiers using asbestos to have their employees medically examined every three years and to keep medical records during their employment and for 40 years after. Workers are required to protect themselves by immediately reporting to the management any defect noticed in exhaust equipment, protective clothing or anything else connected with dust. Factory owners must make their own tests on ventilation equipment. There are provisions for suitable instructions to be given on health risks.

510. A deficiency of the Queensland regulation is that it sets no specific dust or fibre level, despite the fact that asbestos-induced diseases are dose related, although not exclusively so. Both South Australia and New South Wales have been more specific in their requirements. They have incorporated a hygiene standard known as a threshold limit value into their asbestos rules. The standard requires that there be no more than an average of two asbestos fibres per millilitre of air. This is based on the medical opinion that 50 years of exposure to this concentration will produce the earliest signs of asbestosis in about one percent of the workforce. Only New South Wales has taken any steps to deal with the use of blue asbestos (crocidolite), which is now prohibited under the regulations, except when permission for its use is given by the Chief Inspector of the Department of Labour and Industry. This can be granted only under stringent conditions and for a period of no longer than 12 months.

511. It is important to realise that these precautions are only a safeguard against workers contracting asbestosis. The standard does not provide adequate protection against carcinogenic effects of asbestos. The International Agency for Research on Cancer has concluded 'it is not possible to assess whether there is a level of exposure in humans below which an increased risk of cancer would not occur'. The UK Report repeated this conclusion and stated that the estimate of induction of lung cancer from

the 2.0 fibre limit has probably been underestimated by a factor of some fifteen and this resulted in their 1.0 fibre level recommendation.[159] The NH & MRC reports:

> The Australian and UK standards have been based on data related to known cases of asbestosis. Insufficient data were available on which to base a standard for carcinogenesis.

The only protection against cancer would be a complete phasing out of asbestos use —a step recommended by the European Parliament—as soon as substitute materials become available. The NH&MRC Report on the Health Hazards of Asbestos recommended that an explicit obligation should be placed on any person who produces specifications for, or carries on a process involving the use of, asbestos or any product containing it, to consider the substitution of other materials for asbestos in so far as it is reasonably practicable and safe to do so.[160]

512. During the Inquiry the Committee has spoken to a number of major employers who indicated they had largely removed asbestos products used in their workplaces. In virtually all cases suitable substitutes had been found. A major manufacturer of asbestos products, James Hardie Ltd, told the Committee that it had found a substitute for asbestos in flat asbestos-cement or fibro-cement sheets but not for pipes.

513. The two fibres per millilitre standard was adopted from United Kingdom Regulations. In October 1979, after three years of investigation, the UK Advisory Committee on Asbestos reported to the UK Health and Safety Commission. A major recommendation was that the control limit for chrysotile should be 1.0 fibres per millilitre, 0.5 fibres per millilitre for amosite and 0.2 fibres per millilitre for crocidolite. A spokesman for the South Pacific Asbestos Association claimed that the decision to recommend changes to the existing standards was based chiefly on a desire to meet social pressures and on the capacity of industry to pay, and not on medical evidence that the present standard is injurious to the health of asbestos workers.[161] The NH & MRC Report on The Health Hazards of Asbestos (June 1981) recommended that the limit for chrysotile and amosite asbestos be 1.0 fibres per millilitre and that the limit for crocidolite remain at 0.1 fibres per millilitre. The Sub-committee recommended the adoption of these standards by industry as soon as practicable and not later than 31 December 1982. With the objective of a further reduction in its value, the Sub-committee recommended that the standard for amosite be reviewed by the Occupational Health Committee within a period of two years from December 1981.[162]

514. The Sub-committee noted the strong relationship between exposure to crocidolite and the subsequent development of mesothelioma, and recommended that the importation and mining of raw crocidolite fibre and the use of crocidolite in new work be prohibited in Australia. They recommended that raw crocidolite fibre be determined a prohibited substance under the provisions of the Customs (Prohibited Imports) Regulation No. 90, 1956, and that appropriate legislation be introduced to ensure maximum protection of workers and the general public exposed to existing materials containing crocidolite.[163]

Enforcement of Regulations

515. Regulations are only effective if there is wide-spread voluntary compliance backed up by effective enforcement. In Australia there has been a lack of regulation with inspectorates having little control over asbestos exposure. In the United Kingdom, where regulations have existed for decades, enforcement has been a weak point. This was criticised in 1972 by one of the Law Lords in a workers' compensation case. Lord Salmon said in his judgement:

'There are grave dangers involved in working with asbestos which have been well known at any rate since 1931 when the Asbestos Industry Regulations came into force. These regulations laid down the precautions which employers were bound to take for protecting their workmen against the inhalation of asbestos dust and asbestos fumes. It is unnecessary for me to recite these regulations as it is accepted that they were all consistently breached by the appellants. From 1953 onwards factory inspectors wrote to the appellants complaining that, as a result of the appellants' breaches, the conditions of work were dangerous to the health of their workmen and indeed that these conditions were lethal. The appellants appear to have taken little if any notice of these letters and the conditions of work remained much the same as before. It is very odd that this state of affairs was allowed to continue without any positive action being taken until 1964. The appellants were then summoned and fined in all $170. There was even then little improvement; ineffectual complaints were still being made by the factory inspector in 1967. The appellants have sinced closed down.

As a result of these consistent breaches by the appellants and the supine attitude adopted by the factory inspectors the respondent and his fellow workmen were constantly exposed for years to the dangers inherent in inhaling asbestos dust or fumes into their lungs. As a result, they contracted asbestosis which is a form of pneumoconiosis. This is a most insidious and dreadful disease.[164]

Workers' Compensation

516. The NH & MRC lists the factors inhibiting workers' compensation claims for asbestos-related diseases:

- the long time lag between exposure and onset of disease;
- the disparity of workers' compensation legislation and administration between the States;
- the legal limitations on interstate responsibility where exposure has occurred in more than one State;
- the relatively short period which elapses between diagnosis of mesothelioma or lung cancer and the onset of incapacity and death; and
- lack of uniform medical criteria for compensable disease.

517. The NH & MRC agreed on the need for uniform legislation on compensation and representation from both industry and trade unions on compensation boards. Such boards could use a non-adversary system to assess claims and determine the degree of disability. Special provision should also be made for reciprocity in compensation entitlements across State borders.

Endnotes

142. NH & MRC 'The Health Hazards of Asbestos' 1981.
143. NH & MRC, 1981.
144. NH & MRC, 1981.
145. NH & MRC, 1981.
146. NH & MRC, 1981.
147. NH & MRC, 1981, p. 46.
148. NH & MRC, 1981.
149. NH & MRC, 1981.
150. NH & MRC, 1981.
151. NH & MRC, 1981.

152. Sydney Morning Herald, 11.6.79.
153. NH & MRC, 1981.
154. Sydney Morning Herald, 11.6.79.
155. Sydney Morning Herald, 11.6.79.
156. D. H. K. Lee and I. J. Selikoff, 'Historical Background to the Asbestos Problem', *Environmental Research*, 18, 300-314, 1979.
157. Lee and Selikoff.
158. Lee and Selikoff.
159. *Asbestos*, Vols 1 & 2, Final Report of the Advisory Committee, Health and Safety Commission, HMSO, London, 1979.
160. Recommendation 12.
161. Williams Inquiry, Transcript 9 June 1980, p. 13.
162. Recommendation 1.
163. Recommendation 2.
164. 1972, 2, All ER, 1135-1162.

CHAPTER 12

Coke Oven Emissions

518. The first metallurgical step in steelmaking is to reduce iron ore to metallic iron, a process which is most commonly carried out in a blast furnace using coke as a fuel and reducing agent.

519. Metallurgical coke is made by heating crushed coal in large ovens to drive off the volatile components. The ovens prevent the entry of air so that the coal or coke will not burn. As many as 100 ovens may be arranged side by side to form a battery. Each oven is charged from the top through ports and then sealed. When the distillation of volatile compounds is complete the coke, so produced, is pushed from the oven and immediately quenched with a large volume of water.

520. Emissions of environmental pollutants in the coke-making process are associated with:

- coal and coke handling;
- coke oven charging;
- coke discharging;
- coke quenching;
- leaking oven doors; and
- by-products processing.

521. The Committee recognises that without adequate controls, environmental pollution occurs during the coke-making process and, indeed, the whole steelmaking process. It is primarily concerned in this instance with the carcinogenic properties of coke oven emissions and the subsequent effects on the health of coke oven and coke oven by-products, workers. There are other health hazards associated with coke-oven work, such as prolonged exposure to intense heat but these are not dealt with here.

Environmental Aspects

522. Coke making currently takes place in three States: New South Wales, South Australia and Queensland. Environment authorities in these States have advised that coke works are 'scheduled premises' for the purposes of environmental legislation and, as such, operate under licence. These licences normally have conditions attached requiring the implementation of the 'best practicable means' to minimise pollutant emissions to the environment.

523. At the steel manufacturing plants in New South Wales and South Australia, where the majority of coke is produced, pollutant control measures introduced over the last ten years include the provision of:

- coal charge-car scrubbers and afterburners;
- grit collectors on coke quench towers;
- closed circuit water management; and
- dust collection during coke discharge.

In the major coke producing plants, the volatile fraction is collected with part being used for fuel and valuable by-products being recovered from the remainder. It is fugitive emissions of the volatile fraction that concern the Committee.

524. There are three coke works in Australia which use the non-recovery beehive oven process. One is operated by the Queensland Department of Mines at Bowen in Queensland; another is operated by Corrimal Coke Pty Ltd; and the third is operated by Illawarra Coke Co. Pty Ltd, both near Wollongong, New South Wales. In the beehive process all unburnt volatile matter and combustion products of the volatile matter produced during coking are normally discharged to the atmosphere.

525. The two New South Wales companies which operate beehive oven plants have taken measures to control the emission of pollutants during the coking process including:

- bag collection of particulates from the charging operation;
- afterburning of the off-gases from the ovens; and
- hydrogen peroxide additions to coke quenching water to minimise the generation of hydrogen sulphide.

Similar measures are planned for the Bowen plant.

Occupational Health Aspects

526. As early as 1892, it was suggested that exposure to coal tar products might be responsible for cancer of the internal organs. Prior to 1938, the evidence linking lung cancer to coal tar exposures was limited to single case reports.[165]

527. Kennaway's survey of death certificates for England and Wales 1921 to 1931, published in 1936, indicated that the excess of lung cancer mortality for 'gas stokers and coke oven chargers' was approximately threefold. He noted that other coal carbonisation and by-product workers had experienced higher than expected lung cancer mortality.

528. In the 1950s, attention began to focus on the implications of these early studies for the American coal tar industry, including the coking industry. A University of Cincinnati College of Medicine study in that decade found an excess number of deaths from lung cancer in non-white employees in the coke production area. A small excess of lung cancer was noted for white employees.

529. As a result of a joint study by the US Public Health Service and the University of Pittsburgh, begun in 1962, the serious nature of the occupational health hazard to coke oven workers, both white and non-white was demonstrated. This steelworker study is an ongoing project and the mortality data is regularly updated.[166]

530. One of the papers based on this data[167] indicates that, on average, coke oven workers die of lung cancer at a rate of 2.5 times that for all steel workers. The relative risks of lung cancer are 6.87 for men with five or more years employed at full topside, 3.22 for men with five or more years of mixed topside and side oven experience, 2.10 for men with five or more years side oven experience only and 1.70 for all men with less than five years' experience. The study also indicated that coke oven workers have a 7.5 fold risk of dying from kidney cancers. Other studies have suggested a higher than normal incidence of cancers of the larynx, nasal sinuses, pancreas and stomach, and of leukemia.[168]

531. Coke oven workers have an increased risk of developing cancer of the urinary tract. Observations of animals and of human populations have shown that skin tumours

can be induced by the products of coal combustion and distillation. Chemical analysis of coke oven emissions reveal the presence of a large number of scientifically recognised carcinogens as well as several agents known to enhance the effect of chemical carcinogens, especially of the respiratory tract. In addition, workers show an elevated risk of non-malignant respiratory diseases such as bronchitis or emphysema.[169]

United States Regulations

532. The Redmond-Lloyd study was published in August 1972 in the American Journal of Occupational Medicine. Regulations were passed in Washington in January 1977. These federal regulations are binding throughout the United States. Coke oven operators in the United States were required to start immediately on engineering and work practice changes and were expected to comply fully with the regulations by 1980.

533. Coke oven emissions are a complex mixture of particulates, vapours and gases in which multiple carcinogens have been identified. Because neither the manner in which such substances interact nor the specific causative agents have been identified in connection with each of the types of cancers involved, it is not possible to confidently select individual substances to be regulated. The US emission standard utilises an indicator component described as the benzene soluble fraction, that is designed to represent the mixture of known carcinogens present in coke oven emissions.[170]

534. Acknowledging the absence of reliable dose-response data to establish a safe environmental level for exposure to coke oven emissions, NIOSH recommended that the standard be used both as an index of worker exposure to coke oven emissions and as a measure of the effectiveness of engineering controls and operating procedures.[171]

535. The 1977 United States regulations set a limit for coke oven emissions, averaged over an eight hour shift, of 0.15 milligrams of coal tar pitch volatiles per cubic metre of air. The regulations required that this limit be achieved at coke oven workplaces as soon as possible, and no later than 1980. They oblige employers to allow employees to observe tests conducted by management to determine the level of emissions. Employers must be prepared to answer questions about the testing procedure and to give employees the results of the tests in writing. The regulations seek to control emissions within the ovens and to use the gas collection system to remove them. Respirators and masks are considered unsatisfactory substitutes and are to be used only for emergencies or special occasions. The regulations give complex instructions for engineering controls, work practices and hygiene facilities, medical examinations and for the education and training of workers. Filtered air supplies, protective clothing and equipment, and shower facilities are required to be provided.[172]

Port Kembla Coke Ovens

536. In October 1981, the Committee inspected the coke ovens at Australian Iron and Steel Pty Ltd (AIS), Port Kembla, and took evidence from the Port Kembla Branch of the Federated Ironworkers Association, the Wollongong Branch of the Amalgamated Metal Workers and Shipwrights Union and from Company representatives. AIS says it first heard of the problems regarding coke ovens in 1977. The Federated Ironworkers first discussed the dangers associated with coke ovens at its annual general meeting in 1977. Union-company negotiations began in 1978.

537. Since 1978, AIS has taken some measures to improve the coke oven situation: lunchrooms at the coke ovens were air-conditioned so that the workers could breathe clean air while they ate. The drivers' cabins on the coke-moving machinery were

air-conditioned; medical examinations of coke-oven workers were started; and work commenced on measures to reduce emissions by upgrading seals on pipes and doors.

538. The then New South Wales Health Minister, the Hon. K. Stewart, claimed, in October 1979, that coke-oven workers were well looked after. In the unions view AIS was still far from complying with US regulations. Separate lockers for work and street clothes were not provided, work clothes were not laundered and the number of showers as not adequate.

539. A team from the Health Commission's Division of Occupational Health and Radiation Control and the Department of Industrial Relations and Technology, inspected the coke ovens in December 1979, after the unions complained to the Minister. The DIRT report, which was sent to AIS in March 1980 but not to the unions until September 1980, concluded that 'employees are at a considerable risk to health by the physically and chemically hostile environment in which they must work.' The recommendations included doubling the size of the ablution block, the provision of 'clean' and 'dirty' lockers and the laundering of work clothes by the Company. The report stated that on no account should work clothes be taken home.[173]

540. The Committee was told by AIS that a large ablution block is under construction.[174] Double locker facilities and laundering of work clothes are to be provided for battery workers but not to those who work nearby in the by-products area and the coal washery.[175] A study in the United States of oven and non-oven workers by Redmond et al (1976)[176] indicated that cancers of the digestive system are significantly elevated in non-oven workers. Cancers of the colon and pancreas accounted for the total excess in cancers of the digestive system. All deaths from cancers of the buccal and pharyngeal (mouth and throat) organs in study subjects occurred in non-oven workers and the risk is highly significant. Examination of the results reveals that the excess lung cancer risk is confined to coke oven workers, but that the kidney cancer excess appears in both oven and non-oven groups. The researchers conclude that there is a need to consider non-oven as well as oven workers when evaluating cancer hazards in the coke plant.[177]

541. The union claims that in present working conditions, work clothes cannot be worn more than one or two days and that once-weekly laundering by the company and provision of ill-fitting garments is a disincentive for workers to avail themselves of the facility.

542. There are five coke oven batteries at AIS Port Kembla, numbers one, three, four, five and six, comprising 401 ovens.

543. The union submission pointed out that the Company admitted that the fumes and dust emitted by the ovens exceed National Health and Medical Research Council standards and that they could not reach those standards.[178] Results of emission monitoring to September 1980, provided by the Company, appear at Table 4 and show emission levels well in excess of the level set by the NH & MRC.

544. A major source of emission from the ovens is leaking oven doors. AIS has commenced a door conversion program for all the doors on batteries four, five and six. This was to be completed by 1982. The new doors, Japanese designed, are self-sealing and reduce emissions significantly. The inter-departmental report recommended, in March 1980, that the program of replacing oven doors should be examined with the objective of diminishing the two year period to completion then planned. In evidence to the Committee, in October 1981, AIS indicated that this work was progressing even more slowly than originally anticipated because engineering difficulties had been encountered. The Committee believes that this program is proceeding far too slowly and is not being accorded the priority it deserves.

Table 4: COKE OVENS DEPARTMENT—PORT KEMBLA Summary of results for Benzene soluble fraction of total particulate in matter for coke ovens wages personnel (all results to 15 September 1980) (mq/m³)

Classification	*Ram Att.*	*Ext Att.*	*Lidman*	*Valve-man*	*Charger Driver*	*Ext. Driver*	*Ram Driver*	*Hot Car Driver*	*Regulator*	*Gallery Man*	*Door Adjuster*	*Wharf-man + Screens*	*Maint-enance*
No. 1 Battery													
Average Reading	0.15	0.31	0.20	0.18	0.24	0.18	0.08	0.15	0.06	N.D.	1.95	Comb.	0.26
Standard Deviation	0.15	0.58	0.18	0.12	0.17	0.13	0.08	0.15	0.02		3.33	with	0.18
Range	0.02–	0.04–	0.05–	0.05–	0.05–	0.10–	0.01–	0.02–	0.05–		0.10–	No. 3	0.10–
	0.47	2.10–	0.66	0.50	0.52	0.33	0.19	0.34	0.09		10.48	Batt	0.78
Number of Readings	14	12	13	12	12	3	4	4	4		9		33
No. 3 Battery													
Average Reading	0.73	0.69	0.70	2.18	0.60	0.10	0.17	0.19	3.46	N.D.	1.81	0.20	Comb
Standard Deviation	0.90	0.96	0.80	1.68	0.25	0.12	0.18	0.13	9.01		2.03	0.13	with
Range	0.28–	0.16–	0.12–	0.54–	0.12–	0.01–	0.05–	0.04–	0.05–		0.02	0.02	No. 1
	3.08	3.93	3.28	6.79	0.94	0.18	0.38	0.30	33.10		6.28	0.70	Batt
Number of Readings	9	15	14	17	15	2	3	3	13		15	50	
No. 4 Battery											(4 and 5)		
Average Reading	0.21	0.18	0.65	0.64	0.45	0.18	0.13	0.09	0.17	0.18	0.72	N.A.	0.36
Standard Deviation	0.17	0.16	0.51	0.82	0.54	0.19	0.09	0.05	0.13	0.10	2.17		0.60
Range	0.06–	0.05–	0.12–	0.12–	0.02–	0.02	0.03	0.04	0.01	0.07	0.01		0.01
	0.64	0.59	2.19	3.51	1.51	0.57	0.26	0.16	0.58	0.36	13.29		2.58
Number of Readings	14	14	17	15	14	9	5	5	21	7	44		32
No. 5 Battery													
Average Reading	0.22	0.66	0.49	0.74	0.57	0.82	0.26	0.12	Comb	Comb	Comb	N.A.	Comb
Standard Deviation	0.36	0.41	0.19	1.12	0.70	1.34	0.22	0.11	with	with	with		with
Range	0.02–	0.01–	0.26–	0.01–	0.02–	0.01–	0.01–	0.02–	No. 4	No. 4	No. 4		No. 4
	1.09	1.25	0.69	3.35	1.90	3.52	0.54	0.35	Batt	Batt	Batt		Batt
Number of Readings	8	8	5	8	9	6	4	7					
No. 6 Battery													
Average Reading	0.79	0.37	1.02	0.52	0.83	0.33	0.07	0.22	0.58	0.14	0.25	N.A.	Comb
Standard Deviation	1.61	0.32	1.86	0.37	0.99	0.56	0.03	0.18	1.30	0.08	0.26		with
Range	0.02–	0.02–	0.06–	0.08–	0.01–	0.06–	0.03–	0.04–	0.10–	0.06–	0.01–		No. 4
	6.08	1.02	6.34	1.33	3.81	1.89	0.13	0.55	3.80	0.31	1.37		Batt
Number of Readings	13	13	11	11	13	10	8	10	8	7	39		

N.A.—Not applicable
N.D.—Not determined

545. The doors on the two oldest batteries, numbers one and three, are not to be modified. AIS told the Committee that battery number one will operate until at least 1984, when the construction of a new battery, number seven, should be completed and ready for operation. The battery with the worst problems, number three, is of such poor design that it cannot accept any of the modifications necessary to reduce emissions. It is described by the unions as a 'fume-leaking monster'. The Committee's inspection confirmed that observation. AIS says that the time scale for number three battery's operation depends, amongst other things, on the level of industry operation.[179] The union believes the situation on batteries one and three is unacceptable. The Committee considers that under these circumstances the continued operation of battery number three cannot be justified.

546. Despite the carcinogenic properties of coke oven by-products being known since the beginning of this century, no action would appear to have been taken in Australia until the late 1970s to minimise the exposure of coke oven emissions other than the containment within economic limits of a saleable by-product.

547. When the risks involved were clearly identified in the US in 1972, legislation was devised in 1977 as part of a control strategy to reduce the hazard within a specified period. It was claimed in evidence that in Australia neither the company nor the union became aware of the hazards until 1977. The Committee cannot believe that the Australian steel industry was unaware of what was happening in the United States steel industry or the Japanese steel industry, where emission controls had been highly developed. It is Japanese technology which is now being utilised in Australia and the United States to reduce emissions. Also alarming is the failure of occupational health authorities in Australia to become aware and take action to remedy the situation.

548. Health costs, both personal and economic, resulting from the lack of controls will be enormous. If health authorities are so slow to tackle health problems long recognised and legislated for in other countries, then their ability to recognise and regulate newer hazards must be in serious doubt. Health authorities must become much more responsive to occupational health hazards, provide comprehensive regulations for their control and rigorously enforce them.

Endnotes

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CHAPTER 13

Lead

549. Lead is a useful metal, having a multitude of diverse applications and playing an important part in the economies of all industrialised nations. It has been known for over two thousand years that exposure to lead in large doses causes serious adverse health effects and even death. What has emerged in recent years, and is still subject to some controversy, is that exposure to even mild levels of lead can cause insidious mental and behavioural problems, particularly in children. Lead also poses genetic and carcinogenic hazards. It is widespread in the environment and cumulative. Risks are posed not only by high exposures to single sources but by the total body burdens from all sources.

Uses

550. Man has been mining and smelting lead for 4000 years. In this century, lead has been used extensively in paints, metal alloys, petrol additives, batteries, ceramic glazes, glass, enamels, solder, roofing, tank lining, pipes, radiation screening, filler in the vehicle building industry, metallised protective coatings, plastics and electronic devices. Lead arsenate has been widely used as a pesticide for many years but the level of use is now quite small.

Effects of Lead

551. High levels of lead in the bodies of adults causing clinical lead poisoning is usually the result of occupational exposure. Occupational exposure to lead dust may occur during mining, smelting, refining, use and recovery. Exposure to lead fumes may occur during high temperature operations such as welding, or spray coating metals with molten lead.

552. The early effects of lead poisoning are non-specific and, except by laboratory testing, are difficult to distinguish from the symptoms of minor seasonal illnesses. The symptoms are decreased physical fitness, fatigue, sleep disturbance, headaches, aching bones and muscles, digestive problems, abdominal pains and decreased appetite. These symptoms are reversible and recovery appears complete.

553. Later effects include anaemia, pallor, intense periodic abdominal cramping associated with constipation, nausea and vomiting. Drinking alcohol and physical exertion may bring on the symptoms. The radial nerve is usually affected after exposure over a long period of time, and causes 'wrist-drop'. Recovery is slow and not always complete.

554. When the central nervous system is affected it is usually due to the ingestion or inhalation of large amounts of lead. This results in severe headaches, convulsions, coma, delerium, kidney damage and possibly death. As little as 0.5g can kill an adult, whereas children can be killed by less.

555. As a result of more efficient material handling methods and biological monitoring, serious cases of lead poisoning are rare in industry today.

556. The adverse effects of 'low' lead levels in the body are only now becoming clear. The terms 'high' and 'low' are really meaningless in regard to lead levels. Prehistoric man and persons from remote, unpolluted areas of the world have a blood lead level of less than 5 micrograms per 100 millilitres (μg/100 ml) of blood, whereas 'normal' persons in developed countries have blood lead levels between 12-25 μg/100 ml. In terms of total body burden, 'civilized' man from developed countries has about 500 times the amount of lead in his body than his ancestors or those from remote unpolluted areas. If a man suffers lead poisoning and dies from it, he is likely to have a total body burden of 2000 times that of his ancestors but this is an increase of only 4 times his present normal burden.[180]

557. For blood lead the situation is even tighter. Blood lead levels in children are considered not worthy of clinical investigation if less than the NH&MRC recommended levels of 30 μg/100 ml or European Economic Community levels of 35 μg/100 ml. Yet the clinical symptom anaemia, may occur at blood lead levels of 40 μg/100 ml. Blood lead levels of 80 μg/100 ml in children have been associated with encephalopathy, and blood lead levels of 100 μg/100 ml should be treated as an emergency to prevent convulsions, coma and death.[181] It should be noted that the best laboratories are only accurate in measuring blood to about plus or minus 15 per cent, meaning that a child with a blood lead level of 40 μg/100 ml may actually be measured as being 34 μg/100 ml.

558. The Department of Health advised that what are described as 'low' lead blood levels in children have been steadily reducing. Three years ago 40 ug/100 ml was regarded as the upper limit of 'low' because that was the level at which clinical signs begin to appear. Now there seems to be a consensus forming that 25 ug/100 ml is the upper limit of low blood lead levels. Similarly, in occupational health, recommended permissible blood levels have been falling, with WHO recommending that blood lead levels of women of reproductive age and occupationally exposed should not exceed 30 ug/100 ml, to avoid possible harm to the foetus.[182]

559. Tables 5 and 6 show the lowest blood lead levels associated with specific biological changes in children and in adults. It is clear from these tables that as blood lead levels increase so does the order of the adverse health effects. They also indicate that demonstrable biological effects occur at and below levels thought of as 'normal'. There is good reason to expect neurobehavioural disorders at lower levels of lead exposure, as that is generally the effect neurotoxins have below clinical poisoning levels. The effect of a neurotoxin such as lead is maximal on developing brain tissue. The human placenta is not an effective barrier against lead. Consequently, the greatest neurotoxic hazard posed by lead occurs during foetal brain development.

Effects in Children

560. The occurrence of clinical lead poisoning in children, particularly following the ingestion of lead-based paints, is well documented. There is now an awareness that more subtle adverse effects on health and development may result from the chronic absorption of lead in smaller quantities than those known to give symptoms or signs of poisoning and previously thought to be without effect. Low levels of lead, including those previously regarded as 'normal', are increasingly suspected of causing subtler disturbances in learning, impulse control and dexterity. Behavioural disorders such as hyperactivity have been linked with elevated body lead levels of the child before and/or after birth.

Table 5: Summary of lowest blood lead levels associated with specific biological changes in adults

Blood lead level (μg Pb/100 ml)	*Effect*	*Reference*
10	Inhibition of ALAD	U.S. EPA (1979)
15	Elevation of FEP	U.S. EPA (1979)
20-25	Chromosomal abnormalities	Jaworski (1979) Beckman (1978)
30	Toxicity to fetus	U.S. OSHA (1978)
30-40	Reduced fertility (women)	U.S. OSHA (1978)
30-40	Altered spermatogenesis (men)	U.S. OSHA (1978)
40-50	Anemia	U.S. OSHA (1978)
40-60	Psychological, sensory, and behavioral changes	U.S. OSHA (1978)
50	Impaired kidney function	U.S. EPA (1979)
50-60	Peripheral neuropathy	U.S. EPA (1979)
100-120	Encephalopathy	U.S. EPA (1979)

Table 6: Summary of lowest blood lead levels associated with specific biological changes in children[a]

Blood lead level (μg Pb/100 ml)	*Effect*
10	ALAD inhibition
15-20	Erythrocyte protoporphyrin elevation
40	Increased urinary ALA excretion
40	Anemia (lowered hemoglobin count)
40	Coproporphyrin elevation
50-60	Cognitive (CNS) deficits
50-60	Peripheral neuropathies
80-100	Encephalopathic symptoms

[a] Modified from U.S. EPA (1979) sources.

Source: *Lead in the Human Environment*, National Academy of Sciences, Washington D.C., 1980.

561. The problem of measuring the total lead intake received by a child over a long period has not been fully resolved. The concentration of lead in the blood is generally considered to be the most reliable index of recent exposure to lead. At a blood lead concentration of 15 ug/100 ml the results will be accurate within plus or minus 15 per cent providing the quality control is meticulous. Lead content of discarded primary teeth is increasingly being used as an indicator of long-term exposure but the concentration of lead varies according to the tooth examined and the part analysed. Again accuracy and precision are exceedingly important. Most studies of lead effects in children have relied upon a single measurement of the lead concentration in the blood, without making allowance for the intensity, duration and time of exposure. The source of the lead is rarely determined and the physical condition of the child is often not assessed.

562. Many complex responses to lead levels have been observed in extensive studies with experimental animals, mostly at dosage levels too low to produce any overt symptoms of poisoning. For example, a study of postnatal exposure to lead by Sobotka and Cook is notable, because behavioural and learning abnormalities related to those in children with brain dysfunctions were induced by three increasing but particularly low dosage rates. These levels are well within the 'normal' human range in industrialised countries. Lead induced abnormalities include a significant and long-lasting loss of ability to adapt to a changed situation. A study of rats by Overman found increased blood lead levels caused increased motor activity, aggression, impaired motor

coordination, inhibited response ability and reversal learning, in a dose-dependent manner. In some cases, these effects were noted at blood levels well under the 35 mg/100 ml figure regarded by some as not producing deleterius effects in children. Yet all the animals showed normal growth and no overt signs of poisoning.

563. The UK Report recognised the hazard to children living in the vicinity of lead smelters, and in the homes of lead workers who are liable to carry home lead-rich dust on their clothes.

564. The Commonwealth Department of Health has pointed out that psychological tests, especially 'intelligence tests' have, for instance, a long and inglorious history of being used to blame the victim. If a child, or class, or race has done badly in an 'intelligence test', this has been used to categorise him or her as inferior without attempts to ascertain the reasons for the failure, e.g. lack of knowledge of the language, inappropriate test and inadequate schooling. Intelligence tests are mainly designed to test scholastic potential, although the results depend very much on the environment and training of the subject in doing intelligence tests.

565. This pattern occurs in the debate on lead. Higher lead levels tend to be found in lower socio-economic status children, as are slightly lower intelligence test scores. The argument runs: lower socio-economic children have lower intelligence therefore they are less clean and eat lead-containing paint, therefore they have higher lead levels. It is usually put more subtly than this, often only by implication, but it runs through much of the literature.

566. One study suggesting that this argument does not hold is a pilot study performed by two members of the United Kingdom Department of Health and Social Security Working Party on Lead in the Environment, which produced the Lawther Report, who gave psychological tests to children who had had their blood lead levels sampled for the EEC blood lead survey.[183] The researchers found that, even after correcting for socio-economic status as best they could, there was still an intelligence deficit associated with blood lead levels greater than 12 ug/100 ml. This is uncomfortably close to the level at which blood and brain enzymes are inhibited.

Effects of Lead on the Structure and Function of the Brain

567. There is considerable evidence that lead-induced effects on behaviour and learning ability are associated with physical changes in brain structure and biochemistry.

568. Lead at low doses has been shown to be inhibitory towards at least eleven brain enzymes. It has also been shown that lead strongly inhibits the uptake of intracellular calcium at concentrations well below those which cause acute poisoning symptoms. There is a large body of evidence that low-level lead interferes with numerous important chemical mechanisms involved in the brain's maturation, its neurotransmitter metabolism, the regulation of its energy supplies, its mediation of sensory inputs, and its behavioural outputs.

569. The evidence which shows that low-level lead produces observable changes in the physical structure of the brain is also confirmation that the reported effects on behaviour and learning ability are real. It seems a matter of common sense that changes in vital cerebral structures will tend to alter the brain's functions and outputs. Although the normal brain possesses considerable 'reserve' circuitry, even this may be impaired by early developmental damage.

570. Inhibition (poisoning) of enzymes in the brain, blood, bone, gut, liver and kidney begins at very low levels of blood lead. For example, the enzyme ALAD (d-Aminolaevulinic acid dehydrogenase) found in the blood and brain is affected at a blood lead level well below 10 ug/100 ml. In the blood the first clinical sign—anaemia—begins at a blood level of 40 ug/100 ml. Brain lead levels may be 5-10 times that of blood lead levels.[184]

571. To detect subtle brain damage it is necessary to turn to brain enzyme degradation products found in the blood or urine, electroencephalograms (which record only the brain's gross electrical output), or to incompletely understood psychological testing, which, in general, is more reliable in detecting injury in groups of children than in individuals. There is also fierce controversy about what the tests measure, what constitutes a significant effect in a psychological test, and what any adverse effect found is due to.

Effects of Prenatal Exposure to Lead

572. Neurotoxins generally produce disturbances of behaviour and learning ability as the earliest symptoms of neurotoxic effect. This concept has more recently been extended to include behavioural teratogens. There is growing evidence that substances which are overtly teratogenic to the central nervous system of the foetus can cause post-natal behavioural abnormalities even in seemingly normal offspring. These effects of pre-natal exposure are well known for both lead and mercury where the foetal brain is very much a target organ.

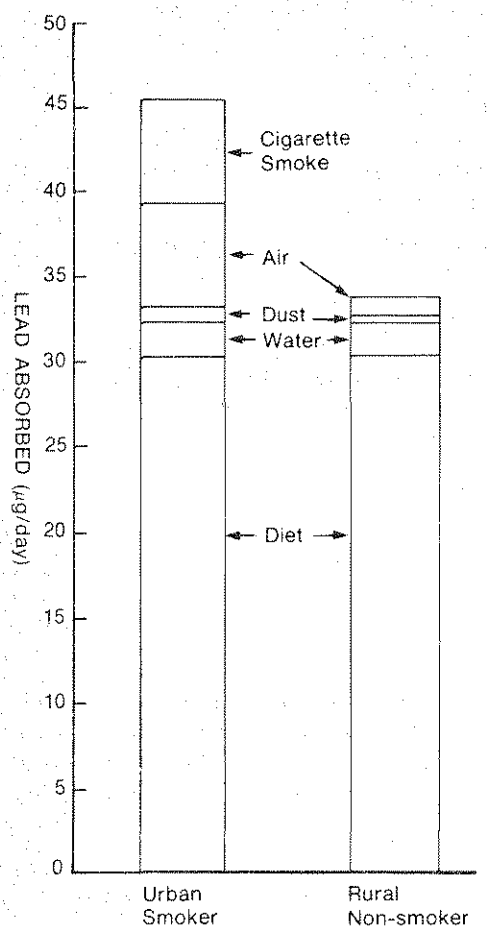
573. A greater proportion of the total body burden of lead is concentrated in the foetal brain than in the child brain, so higher sensitivity is to be expected on these grounds alone, before allowing for greater effects due to the immaturity of the foetal brain. These considerations lead to the belief that pre-natal exposure to low level lead from the mother is highly capable of producing behavioural effects in apparently normal offspring.

574. In recognition of this, the UK Health and Safety Executive has published Draft Recommendations which propose that pregnant women should be prohibited from work involving exposure to lead, and that the maximum blood-lead level for female workers of child-bearing capacity should be limited to 40 ug/100 ml (about half that for males). The US maximum blood-lead level for industrial workers is 40 mg/100 ml, which came into force in 1979.

575. The abortifacient and foetotoxic properties of lead have been known for over 50 years, and probably in a general way for centuries. Proposals to limit exposure by females of child-bearing age are long overdue, but are some ways inadequate. Such proposals are based on the incorrect assumption that only maternal exposure presents a hazard to the unborn child. There is evidence that modest elevations of blood lead in male industrial workers produce significant seminal damage, usually teratospermia. It is known from animal studies that survival prospects and physical development of the foetus and post-natal motor function in offspring born alive can also be harmed by the pre-conception effects of lead on the father alone. Consequences of dual parental exposure are even more severe.

576. Research on rats has demonstrated adverse reproductive and behavioural consequences at blood levels in the range 6–26 ug/100 ml. This level is typical of those now found in human populations. These figures are even more significant as it has been shown that rats are generally less sensitive to lead than humans.

Figure 5



Estimated contributions of different sources of exposure to the total lead absorbed by two different subsets of the general population.

Source: Lead in the Human Environment, National Academy of Sciences, Washington D.C., 1980.

577. There would therefore seem to be considerable justification in setting the 'no-demonstrated-adverse-effect' blood lead level of children and pregnant women much lower than the present 30-40 ug/100 ml.

Maternal Exposure—Human Studies

578. Although the above effects have been demonstrated using animal studies, there is a growing body of evidence that demonstrates similar effects on humans ranging from foetal death to mental retardation of children born alive.

579. It was found, for example, that lead levels in stillborn and malformed infants from Birmingham and Oxford areas of the United Kingdom were some 5-10 times above normal. On the other hand, zinc and calcium, which are toxicological antagonists of lead were abnormally low in many cases. This indicates some of the complexities of the interrelationships involved. Perhaps serious effects from high blood lead levels are only manifest in conjunction with low calcium and zinc levels.

580. Further studies have linked high lung-lead and placental lead with still births and malformation. This is signficant in that there is little correlation between lung and placental lead levels and blood lead levels.

581. A study in Scotland showed that babies with a slightly elevated blood lead level soon after birth had a significantly increased risk of developing overt mental retardation later in life. Other studies indicate that increased maternal (and thus foetal) blood lead level tends to cause premature birth.

Effects of Industrial Exposure

582. A US study of over 7 000 employees in lead smelters and battery plants, indicate a higher overall mortality than for the general employed population. Excessive death rates were related to various kidney diseases, and cancers of the respiratory system and digestive organs. Less clear indications were reported for excess deaths from diabetes mellitus, rheumatic fever and certain types of heart disease.

583. The combined effect of airborne lead and smoking is a multiplied effect and not additive, and provides one reason why cigarette smokers in cities have a higher incidence of cancer than smokers in rural areas, and could explain the abnormally high cancer rate near main roads. (See Figure 5) An association has been demonstrated between a form of kidney cancer in children and the father's occupational exposure to lead at the time of pregnancy.

584. A reasonable assessment would be that lead is probably only a weak carcinogen in its own right, but can act as a strong co-carcinogen, enhancing the carcinogenicity of other substances.

585. There seems to be an increased prevalence of symptoms of fatigue, headaches, irritability, insomnia, pains in joints and muscles, abdominal pains and dyspepsia among lead workers. These symptoms are the early indications of lead poisoning. These adverse effects among adults occur at blood lead levels around 30 μg/100 ml.

Sources of Lead in the Environment

586. Man has always absorbed some lead from his natural environment, although this contribution is usually small in comparison with that derived from lead liberated by his own activities. Natural mobilisation by weathering of mineral deposits and gaseous volcanic emissions are estimated to release about 210 000 tonnes of lead into the global

environment each year. Studies by CSIRO suggest that natural chelatable, and therefore mobile, lead in Australian rural soils lies between 4-50 ppm which is similar to soils in other countries. In most of the developed world, emissions from human activities in the mining, smelting and use of lead provide the main contribution to airborne lead.

587. Lead found in a component of the particulate matter in air, results primarily from the combustion of lead-containing petrol, from certain industrial processes, and to a lesser extent from coal burning and weathering of paints. The current maximum atmospheric lead concentration recommended by the National Health and Medical Research Council (1.5 $\mu g/m^3$, three-month average) is consistently exceeded at many locations in Sydney, Brisbane, Melbourne, Adelaide and Perth (see Figures 6 & 7). Table 7, taken from the Australian Environment Council publication 'Air Emission Inventory (1976) for the Australian Capital Cities', shows over 90 per cent of airborne lead in urban areas as coming from motor vehicle emissions.

588. Airborne lead eventually settles on the ground. It then enters the soil where it is accessible to plants, or is absorbed into water run-off where it can enter the water supply system. A survey of lead levels in soil around the Port Pirie lead smelter in South Australia indicated raised heavy-metal levels close to Port Pirie. Even if all aerial contamination as a result of smelter stacks ceased immediately, the soil, and vegetables grown in it, will continue to contain raised levels of heavy metals, including lead, indefinitely. A similar situation would exist if leaded petrol emissions were to cease, in that soil contamination would persist but would not continue increasing.

Table 7: Summary of estimate of lead emissions, tonnes per year

	petrol engines[1] (A)	sump oil comb-ustion (B)	other comb-ustion	miscell-aneous sources	Total	% (A & B)
Adelaide	415 (477)	70	13	10	508 (570)	95 (96)
Brisbane	373 (429)	56	14	7.6	451 (507)	95 (96)
Canberra	129 (148)	28	3.3	1.1	161 (180)	98 (98)
Hobart	44.4 (51)	3.1	2.1	1.1	50.7 (57.3)	94 (94)
Melbourne	934 (1070)	77	43	20	1074 (1210)	94 (95)
Perth	510 (587)	78	12	6	606 (683)	97 (97)
Sydney	943 (1080)	87	42	88	1160 (1297)	89 (90)

Notes: 1. The figures without brackets were estimated from vehicle kilometres travelled. The figures in brackets were estimated by comparing estimated petrol consumption (from vehicle kilometres travelled and fuel consumption data) with national petrol sales figures.

Source: *Air Emission Inventory (1976) for the Australian Capital Cities*, Australian Environment Council, AGPS, 1981.

589. Food may contain small amounts of lead from canning processes and contact with glazed containers as well as from polluted air. Food may be contaminated from lead in solder used in the manufacture of cans. High levels of lead have also been found in food from lacquered cans, probably from additives in the lacquer. Major contributions to the body burden may be made in some areas by lead water pipes and lead-lined storage tanks, and lead compounds in paint and primers used in the past. The risk to young children who chew old painted surfaces is well known. Lead levels in Australian drinking water supplies are much lower than in countries such as the United Kingdom and do not seem to be a significant factor in blood levels.

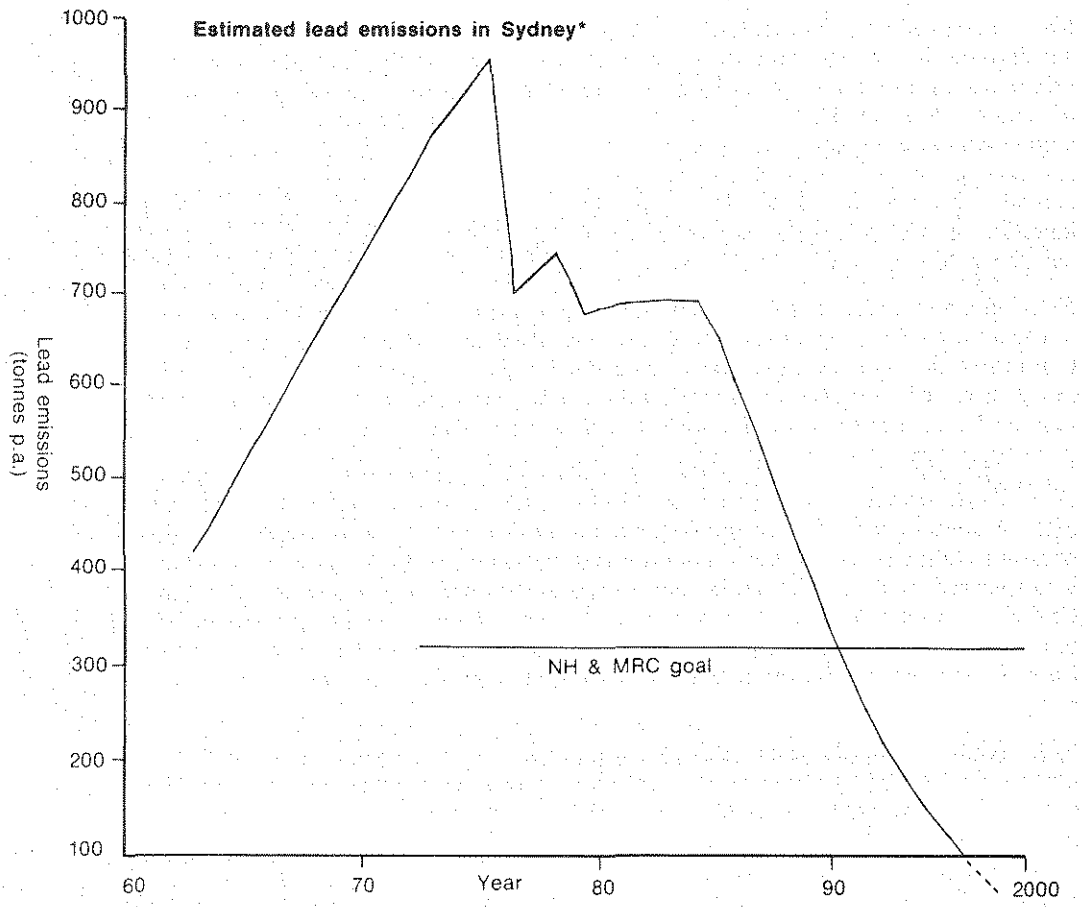


Figure 6

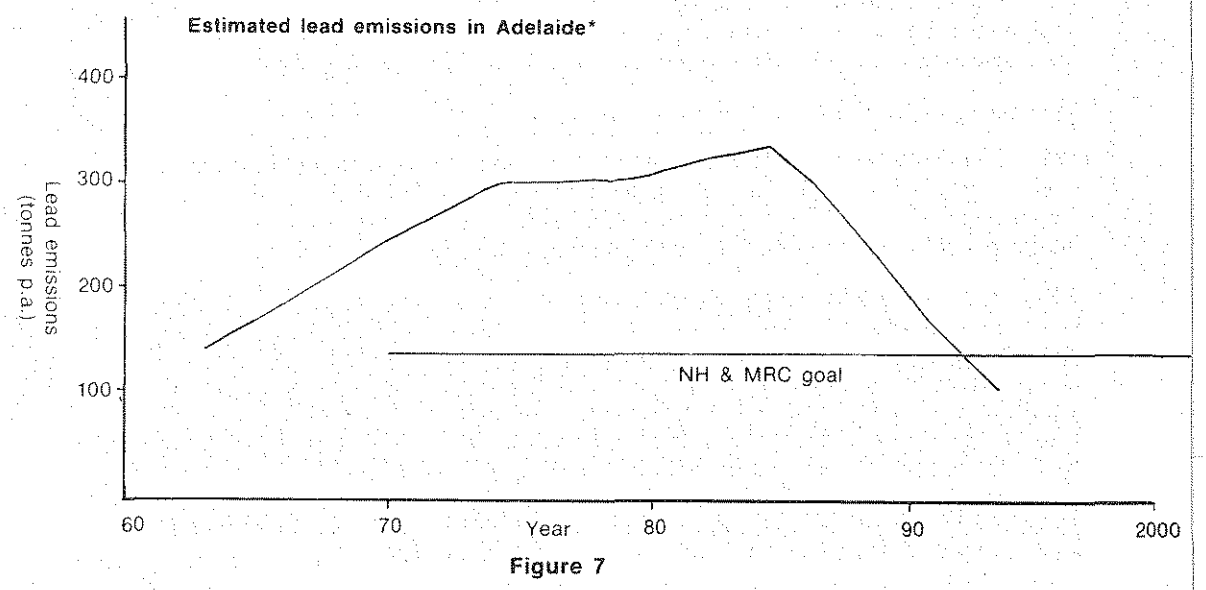


Figure 7

* Adapted from Committee on Motor Vehicle Emissions 'Report on the Development of a Long-term National Motor Vehicle Emission Strategy'.

590. The production and industrial use of lead also gives rise to much dust and fumes within factories and their immediate environment. Lead contamination of the dust in urban playgrounds is a major concern. In United States surveys, street dust in a number of cities averaged 1636 ug/g in residential neighbourhoods and 2413 ug/g in commercial and industrial areas. It is well established that children who play in dust and soil, ingest lead through handling food, mouthing fingers, thumb-sucking, oral contact with toys and other objects and pica, which is the abnormal and habitual ingestion of non-food items such as dirt, paint, dust, cigarette butts, etc. Correlations have been demonstrated between lead in soil, lead on hands and lead in blood.[185]

591. Among the many sources of lead, special concern has been voiced about pollution of the air by petrol engines using fuel to which alkyl lead compounds have been added to improve the octane rating. This practice began over 50 years ago and, although the lead content of petrol has been reduced in recent years, the increase in the use of this fuel has led to it becoming the major contributor of lead in the air. Airborne lead may be taken in directly by inhalation and by ingestion, through the contamination of food and dust.

592. Since less than 50 per cent of lead emitted from vehicle exhausts falls out in close proximity to the road, (10 per cent within 100 metres according to some researchers) it is not surprising that fallout rates can be substantial in even rural areas. Studies by CSIRO have shown that the top layer of rural soils is contaminated with lead isotopes of the type found in leaded petrol at distances of up to 50km from Adelaide and this lead has been less tightly bound in the soil than natural lead, suggesting a greater uptake by plants.

593. Results of an EEC Blood Lead Survey in the United Kingdom show lead burdens among children living near the M4 Motorway are some of the highest in the whole survey. They are higher than for most of the children listed as living near lead works. Petrol-sniffing is also a serious problem in some communities, indicated by high blood lead levels.

594. Organo-lead compounds can contribute up to 15 per cent of airborne lead. They are known to be more acutely toxic than inorganic lead, and more highly mutagenic. Little is known about the effects of prolonged low-level exposure to organo-lead compounds. The sparse information concerning the effects on children comes from the few tragic cases of petrol-sniffing which have been reported in medical literature.

Monitoring of intake of lead from the environment

595. The Department of Health advised that monitoring the intake of lead from the environment is not carried out in Australia or anywhere in the world, as far as the Department is aware. Some short-term studies have attempted to monitor the lead intake in food, water or air, but no study has really examined the total input.

596. Many of the studies have major deficiencies. Usually air lead content is assumed to account for say 10 per cent of blood lead levels, food and drink 90 per cent, and 'safe' levels of lead in air, food, water, etc. worked out from this base. Because it ignores the contribution of airborne lead to dust, this technique may overemphasize the significance of lead in food, but at the same time minimizes the importance of ingested lead. It should be noted that the amount of lead absorbed from food is usually taken to be 10-20 per cent (40 per cent in children) whereas, according to some studies, over 50 per cent may be absorbed. Thus the two factors may cancel out.Both the National Health and Medical Research Council, through its Market Basket Survey of foodstuffs, and the New South Wales Health Commission, have examined the lead content of Australian foods and concluded that the lead levels in foods do not constitute a health risk.

597. The NH&MRC's review of the scientific literature suggested that up to 20 per cent of blood lead levels could come directly from inhalation of airborne lead. Accordingly, the NH&MRC recommended a maximum permissible lead level for ambient air of 1.5 ug/m^3, which could lead to an increase of blood lead levels of 3 ug/100 ml, which is 20 per cent of 15 ug/100 ml.

598. The NH&MRC recommended maximum geometric mean blood lead level of a population of children (the group at highest risk to the dangers of lead) is 15 ug/100 ml. If the geometric mean blood lead level is 15 ug/100 ml, then 99.5 per cent of the population at risk will have a blood lead level of less than 30 ug/100 ml which is the level of concern in the individual at which the NH&MRC recommends investigation to find the source of exposure.

Lead Technology

599. Lead and its chemical compounds are technologically useful and economically valuable. Against this, the harmful effects are not easily quantifiable in cash terms. However, for many applications of lead and its compounds, adequate, even superior, less toxic substitutes are available. Often retention of lead based products seems to be largely a matter of conservatism, lethargy or ignorance. The awareness of substitutes should be encouraged.

600. Lead-free paint pigments are available, as are lead-free driers for paints and varnishes, and lead-free earthenware glazes. Lead-free food cans using tin solder are used for baby food, but not for most food, with the result that some degree of lead contamination of tinned food is the rule rather than the exception. There are no warnings on lead-soldered tinned food containers that the contents are unfit for babies.

601. Lead storage batteries have no real substitutes at present, but pose no lead hazard during use. The main hazard arises during manufacture and to children living near battery factories, and through recovery of lead at scrap yards.

602. Over 10 per cent of all lead mined is used in the organo-lead petrol additives tetra ethyl and tetra methyl lead, and it all ends up widely dispersed throughout the human environment. None is recovered. With lead in petrol, the problem is not one of removing the lead, but of preventing its addition. There are alternatives to lead as an 'anti-knock' or octane-raising additive: e.g. the use of less toxic octane improvers, or direct refining and processing of petroleum to a higher octane rating.

603. The claim is frequently made, usually by petrol companies, that extra refining uses more energy and would increase requirements for crude oil. However, the US EPA reported that low-lead regulations would have only a minimal impact on crude requirements, and would add less than 0.1 cents per US gallon to refinery costs. All Japanese cars are now made to run on lead-free petrol. This indicates the importance the Japanese place on reducing the amount of lead in the environment as Japan has been one of the countries most seriously affected by oil shortages and price rises.

Economic Aspects of Lead Pollution

604. The financial cost of pollution in general is so difficult to quantify that it has generally been ignored. Economic estimates have usually been more concerned with the cost of pollution control than the cost of pollution. The large increase in the world price of lead in recent years had meant that substitution has generally become more attractive.

605. The potential hidden costs of lead remaining in the environment in large quantities are vast. Lead burdens now associated with adverse effects on development and brain function are so low that levels regarded as 'normal' for most children should be regarded as actively or potentially pathogenic. It is therefore a logical step to examine the statistics for those categories of effect where any toxic effects of lead would be expected to appear: birth malformations, severe handicaps, and maladjusted children requiring care in special schools. The weight of evidence points to lead as one of the factors in these phenomena, and it is possibly a major one. The rewards for even a minor amelioration would be enormous in both economic and human terms.

606. The United States National Academy of Sciences, in its Report 'Lead in the Environment', states that 'the hypothesis that people would be healthier in subtle ways if the average blood lead level was 1-2 μg/100 ml (or less) deserves sober consideration'.[186] It concluded that available data are inadequate to quantitatively assess the relative importance of the various sources of lead to which people are exposed and called for the continued control of all sources of lead.

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CHAPTER 14

2,4-D and 2,4,5-T

607. The two phenoxyacetic herbicides 2,4-D and 2,4,5-T have long been registered but have subsequently been subject to widespread questioning concerning their safety. The Committee is not able, in a short paper, to assess the safety of these chemicals, nor does it have all the toxicological expertise necessary to do so. Rather the Committee wishes to trace the testing, assessment and registration procedures and the action taken following evidence of possible harmful effects.

608. Historically, Australia was one of the first countries with legislation requiring the assessment and registration of pesticides. The first such legislation was introduced by New South Wales in 1945 and was soon followed by similar action in Victoria and Queensland. Early pesticide registrations were largely concerned with efficacy.

609. The initial registration of phenoxyacetic herbicides in Australia was undertaken by the States. Enquiries reveal that the New South Wales Pesticide Registration Records for the period 1945-50 were destroyed by fire and thus, details of the initial Australian registration have been lost. Queensland and Victoria have indicated that early registration in those States was based largely on efficacy considerations. There has never been any doubt that 2,4-D and 2,4,5-T are effective herbicides over a wide range of weeds. Any toxicological data submitted in support of a registration application was in keeping with the then 'state of the art' of toxicology and mainly confined to acute toxicity data and on occasion, 30 and 90-day rodent studies.

610. Because 2,4-D and 2,4,5-T could be made by classical manufacturing processes for which it was not possible to claim any novelty, there was no possibility of anyone obtaining a patent over their manufacture. In 1945-46, as the news of the effectiveness of these compounds was received in Australia, several local companies commenced studies which led to the development of suitable industrial processes for their manufacture in 1946, and supplies, first of 2,4-D and then 2,4,5-T, became available for experimental purposes soon after.

611. All applications for registration were accepted without change to the claims made by the manufacturers and with minimal evidence of efficacy and safety, as was the practice of the time. Ivon Watkins Limited of New Zealand, a licensee of American Chemical Paints Incorporated, which first marketed 2,4-D and 2,4,5-T products in the United States, entered into an arrangement to develop, formulate and market a range of phenoxy herbicides and these were introduced to Australia in 1948.

612. Over the intervening 35 years there have been many changes to the pattern of use of phenoxy acid herbicides, resulting from extensive local research and experience and technological developments from overseas. These changes have also resulted from the development of other herbicides which have proved superior to phenoxy acid herbicides in specific situations. Considerable progress has occurred in the science of toxicology since those early times, and particularly since the 1960s. Over this time, toxicological assessment of pesticides has become increasingly sophisticated.

613. As stated in Chapter 4, there is no program of systematic assessment to ensure the safety of those chemicals still in use but registered before comprehensive toxicological assessment was required. The phenoxyacetic herbicides are exceptions in that they have received much public attention and scrutiny. They also exemplify the problems

that occur when the assessment of test results becomes the subject of dispute amongst the relevant scientific experts.

614. With regard to NH&MRC consideration of phenoxyacetic herbicides, the Pesticides and Agricultural Chemicals (Standing) Committee appears to have made its first recommendation concerning 2,4,5-T and 2,4-D at its August 1962 meeting. Since that Committee had only commenced operation, it relied heavily on overseas data and recommendations. Its initial 2,4,5-T and 2,4-D recommendations were, in fact, based on Canadian requirements. Reports of the Poisons Schedule Committee make no mention of 2,4,5-T or 2,4-D before 1966.

615. Following a report in 1969 of teratogenesis in rodents administered oral doses of 2,4,5-T, the NH&MRC reviewed the use and safety of 2,4,5-T in 1970. Subsequent reviews were undertaken in 1972, 1975, 1978, 1979 and 1980. A Working Party met in January 1982 to consider the implications of epidemiological studies from Sweden, which showed a possible association between exposure to phenoxyacetic herbicides and other chlorinated chemicals and the incidence of soft tissue sarcomas.

616. The Department stated that 'a specialist working party met on three occasions to study the total information relating particularly to 2,4,5-T'. Despite several requests, the Committee received no evidence from the Department that there had been at each review a full assessment or re-assessment of the chemicals themselves. Rather the reports of these NH&MRC reviews dealt primarily with the consideration and rejection of studies critical of the two chemicals. Registration requirements for new chemicals today include the provision of test results for a number of toxicological effects. The Committee sought information as to which studies had been relied upon to establish the safety of each chemical at each review, as distinct from critical studies rejected. The Committee was particularly interested in the evidence that established that the two chemicals had no carcinogenic, mutagenic or teratogenic effects.

617. After a series of requests, the Department of Health advised that:

> The Committee will appreciate the difficulty of attempting to define the evidence which was relied upon on each occasion for decision making, whether it be related to carcinogenic, mutagenic, teratogenic or any other effect. It would be necessary to divert scarce resources to undertake a major investigation before attempting to give even a qualified answer.[187]

The Department provided several extensive bibliographies of material on these two chemicals. The Department also provided summary reports of each review undertaken by the NH&MRC. These are reproduced at the end of this Chapter. The Committee is unable to determine, from the information provided, whether or not adequate reviews have been undertaken of the safety of these two products.

Dioxin Contamination

618. The toxicity of 2,4,5-T is further complicated by contamination with TCDD. TCDD (2,3,7,8-tetrachlorodibenzo-p-dioxin) often referred to by its trivial name Dioxin, can be produced under certain conditions during the manufacture of 2,4,5-trichlorophenol (TCP). The trichlorophenol, contaminated with TCDD, can then be used in the preparation of other chemical products such as the herbicides, 2,4,5-T, silvex, erbon, fenchlorfos, the bactericide hexachlorophene and the wood preservative pentachlorophenal. The presence of TCDD as a minor contaminant in the routine manufacture of TCP and hence 2,4,5-T has been known for 20 years. It is only when the reaction temperature exceeds 200°C that appreciable quantities of dioxin are produced.

619. The toxicity of TCDD and its effect on the skin (chloracne) have been known for several years following a series of accidents in plants manufacturing TCP in the UK, USA, Germany and the Netherlands. As the degree of adverse environmental and health effects due to TCDD became more apparent, the permitted levels of TCDD in products such as 2,4,5-T were gradually lowered. Early samples of 2,4,5-T used by the USA as a defoliant in Vietnam, frequently had TCDD levels around 50 ppm and a number of unsubstantiated cases of adverse health effects on the population were reported. The acceptable level of TCDD in 2,4,5-T has been reduced to 0.1 ppm in Australia and in most other countries where 2,4,5-T is still used.

620. TCDD has an exceptionally high toxicity. An LD_{50} (a dose lethal to 50 per cent of the population) of 0.6 ug/kg has been reported for female guinea pigs. A single oral dose of 10 ug/kg in rabbits is lethal and 1 ug/kg causes serious liver damage and chloracne. Rats seem to be less sensitive in view of the fact that ten consecutive oral doses of 8 ug/kg each, given daily during pregnancy, caused death in only one out of eight treated animals. In the same study, foetal toxicity was observed at dose levels of only 0.125 ug/kg. Clinical signs in animals include the following: significant weight loss; atrophy of the kidney; necrosis of the liver; vascular lesions and thrombosis; stomach ulcers; and gastro-intestinal haemorrhages. TCDD directly applied to the skin causes chloracne.

621. Since TCDD is formed during the heating of 2,4,5-trichlorophenol under certain alkaline conditions, it would be expected that related chemicals could be formed under similar conditions during the manufacture of other chlorinated phenols. The other widely used chlorinated phenol is pentachlorophenol (PCP) which is used as a fungicide and wood preservative.

622. 2,4,5-T is a widely used herbicide which is valuable because of its relatively low cost and its effectiveness. In Australia, agricultural authorities regard the continued use of 2,4,5-T as economically important. It is noted, however, that in the USA and UK a number of possible alternatives to 2,4,5-T are available that are not based on 2,4,5-trichlorophenol and hence do not contain dioxin. These alternatives are ammonium sulphamate, glyphosate and fosamine. They are not registered in Australia for the same purposes as 2,4,5-T because they have been shown to be ineffective against the noxious woody weeds for which 2,4,5-T is specifically required.

623. Unfortunately, official advice may sometimes give the wrong impression. An example of this is a pamphlet on pesticide safety produced by the Queensland Division of Industrial Medicine. This describes 2,4-D and 2,4,5-T when used under normal conditions of spraying and mixing as having 'nil toxicity'. ('Pesticide Safety', Brian Austin, Minister for Health, produced under the direction of the Division of Industrial Medicine, Queensland Department of Health.) Dr A. L. Black, Medical Adviser in Toxicology of the Commonwealth Department of Health, stated that these products could not be described as having nil toxicity.

EXTRACTS FROM REPORTS OF THE NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL RELATING TO 2,4,5-T

Ninetieth Session, October 1980

Review of scientific evidence on 2,4,5-T

624. The Council noted the results of recent scientific investigations, in particular those in Sweden into occupational exposure of forestry workers to 2,4,5-T, and the mouse reproduction studies undertaken in the United States.

625. The Council also noted details of proposed further studies both in Australia and overseas.

626. In the light of this most recent review of the scientific evidence the Council decided that no changes to its current recommendations on 2,4,5-T were necessary.

Eighty-Seventh Session, June 1979
2,4,5-T and the dioxin TCDD

627. Council received the report of the ad hoc Working Party on the Use and Safety of 2,4,5-T.

628. It noted the conclusions of the Working Party and particularly those on a preliminary report entitled 'Investigations of a possible association between the use of the herbicide, 2,4,5-T and the incidence of neural tube defects in New South Wales', by Dr Barbara Field and Professor Charles Kerr, School of Public Health and Tropical Medicine, Sydney.

629. The Council concluded that the study method and data quality used in the report were not acceptable and a cause and effect relationship between 2,4,5-T usage and human birth defects had not been demonstrated.

630. Studies such as these could not produce conclusive evidence of the existence or otherwise of causal relationships. Any study seeking to obtain such evidence would require different methodology and more reliable data if it were to withstand critical scientific analysis and provide a basis on which to formulate decisions.

Eighty-Fifth Session, June 1978
2,4,5-T and the dioxin TCDD

631. The National Health and Medical Research Council, at the request of the Federal Minister for Health, had re-examined the use and safety of the herbicide 2,4,5-T (2,4,5-trichlorophenoxyacetic acid). Council could find no substantiated scientific evidence of a causal link between the use of 2,4,5-T and human birth defects.

632. Council recommended that the manufacturers give attention to the further reduction of the already low level of TCDD in herbicides with the aim of eliminating its release into the environment.

Eightieth Session, April 1975
2,4,5-T

633. Council considered the most recent reports of teratogenesis following the administration of large oral doses of 2,4,5-T and considered that the available evidence indicated that the impurity tetrachlorodibenzo–para-dioxin (TCDD) was the agent implicated in congenital abnormalities. Council noted that recent information had shown that 2,4,5-T available in Australia contained less than 0.1 ppm of TCDD at which level no teratogenic activity has been reported. Council considered that recommended safety precautions followed in the handling of pesticides should provide adequate protection to all persons exposed to 2,4,5-T in its manufacture and use.

634. Council therefore rescinded the recommendation on 2,4,5-T made at its Seventy-fifth Session.

635. Council recommended that 2,4,5-T containing more than 0.1 ppm of TCDDD should not be permitted for use as a herbicide in Australia and that there should be a maximum residue limit of 0.02 ppm of 2,4,5-T permitted in water.

Seventy-Fifth Session, November 1972
2,4,5-T

636. Council considered recent reports of teratogenic abnormalities in mice and rats following administration of large oral doses of the weedicide 2,4,5-T. This substance is included in Section III of the Recommended Tolerances of Residues of pesticides and Agricultural Chemicals in Foods as published in Appendix VI of the Report of the Sixty-eight Session of the Council. No residues have been detected and none is permitted in or upon food.

637. Council recommended that:

(i) all persons exposed to 2,4,5-T in its manufacture and use should use special precautions, such as protective clothing, to ensure that skin absorption does not occur;
(ii) women in the child bearing age group should not be exposed to 2,4,5-T;
(iii) the residues of 2,4,5-T in water supplies should not exceed 0.02 parts per million.

Seventieth Session, April 1970
Weedicide, 2,4,5-T

638. Council considered recent reports of teratogenic abnormalities in mice and rats following administration of large oral doses of the weedicide 2,4,5-T. This substance is included in Section III of the Recommended Tolerances for Residues of Pesticides and Agricultural Chemicals in Foods as published at Appendix VI to the Report of the Sixty-eight Session of Council. No residues have been detected and none is permitted in or upon food.

639. Council considered that the scientific evidence available required verification because the work did not specifically incriminate 2,4,5-T as a toxicological hazard to humans.

640. Until this information is available Council recommended:

(i) the use of 2,4,5-T in areas where water contamination could occur should not be permitted;

(ii) all persons exposed to 2,4,5-T in its manufacture and use should use special precautions, such as protective clothing, to ensure that skin absorption did not occur;

(iii) until further evidence is available, special precautions should be taken to avoid exposure of women, particularly those in the child-bearing age group, to 2,4,5-T.

7 December 1982

M. J. R. MACKELLAR
Chairman

Endnote

187. Answer to written question, 27 September 1982.

APPENDIX I

Conduct of the Inquiry

1. On 21 February 1980, the previous Committee resolved to inquire into and report on:

the management of chemicals potentially hazardous to health and the environment, particularly:

(a) the adequacy of existing Commonwealth and State legislative arrangements;
(b) research, assessment and dissemination of information; and
(c) international co-operation.

The Committee resolved that a Sub-committee be appointed to conduct the Inquiry. At the dissolution of the Thirty-first Parliament, the Sub-committee had held three public hearings.

2. Upon the re-appointment of the Committee in the present Parliament, the Committee decided to resume the Hazardous Chemicals Inquiry and to conduct the Inquiry as a full committee.

3. On 29 April 1982 the Committee tabled its First Report on the Hazardous Chemicals Inquiry which dealt with the storage, transport and disposal of hazardous chemical wastes.

4. The Committee and the former Sub-committee have taken evidence from 170 witnesses representing Commonwealth and State Government departments and instrumentalities, local government bodies, industry, community and environmental groups, academics, universities, and from individuals appearing in a private capacity. A list of witnesses who have appeared before the Committee is at Appendix 2. The Committee has received 169 submissions and taken 3,761 pages of evidence at public hearings. Evidence given at public hearings is available for examination in *Hansard* form at the National Library and at the Committee Office of the House of Representatives. Public hearings have been held in Canberra, Sydney, Melbourne, Brisbane, Adelaide, Perth, Darwin and Wollongong. The Committee has conducted inspections in Sydney, Port Kembla, Melbourne, Geelong, Perth, Kwinana, Brisbane, Gladstone and the Northern Territory.

5. The Committee acknowledges the co-operation and assistance received from all those who have made submissions, assisted with inspections and to those witnesses who have given verbal evidence to the Committee.

6. Although some of the evidence was taken by the Sub-committee in the Thirty-first Parliament, the conclusions and recommendations are those of the present Committee. The Committee appreciates the contribution made to the Inquiry by Mr M. Baillieu, and Mr J. F. Cotter, who were members of the Hazardous Chemicals Sub-committee in the Thirty-first Parliament. The Committee particularly appreciates the contributions made by the Hon. J. C. Hodges, MP, who was the chairman of the Committee for most of the Inquiry.

APPENDIX 2

LIST OF WITNESSES

Allan, Mr P. B. Acting First Assistant Secretary, Agriculture and Food Services Division, Department of Primary Industry
Allen, Ms L. Executive Member, Queensland Conservation Council
Attwood, Ms P. Co-ordinator, Environment Group, Women's Electoral Lobby (South Australia)
Austin, Mr M. R. Executive Director, South Pacific Asbestos Association
Barry, Ms M. Member, Botany Bay Sub-Region Community Advisory Committee
Belcher, Mr R. S. Chief Chemist, Division of Agricultural Chemistry, Department of Agriculture (Victoria)
Berry, Mrs M. Post-graduate student, School of Australian Environmental Studies, Griffith University
Bisby, Dr J. A. Environmental Health Adviser, Member, Health Committee, Australian Chemical Industry Council
Bissaker, Mr B. A. Assistant Secretary, Customs Inspection and Controls, Department of Business and Consumer Affairs
Black, Dr A. L. Medical Services Adviser in Toxicology, Public Health Division, Department of Health
Blackmore, Mr H. N. Chief Inspector of Dangerous Goods, Dangerous Goods Branch, Department of Industrial Relations (New South Wales)
Blair, Mr W. D. Secretary, Vehicle Builders Employees Federation of Australia (Victorian Branch)
Bolton, Lieutenant Colonel J. C. Senior Executive Officer (Environment), Department of Defence
Bonsey, Ms V. J. Acting Director, Law Revision Branch, Department of the Capital Territory
Bray, Mr J. W. Representative, Local Government Association of Queensland
Brett, Mr B. B. Executive Director, Agricultural and Veterinary Chemicals Association of Australia
Broomby, Chief Superintendent I. Australian Federal Police
Brownlea, Professor A. School of Australian Environmental Studies, Griffith University
Bryce, Mr F. E. Secretary-Treasurer, New South Wales Fire Brigade Employees' Union
Bude, Mrs E. M. Research Officer, Local Government Association of Western Australia
Button, Mr J. C. E. Private Citizen, and Chief, Health and Safety Division, Australian Atomic Energy Commission
Caddy, Mrs Y. D. Member, Environment Group, Women's Electoral Lobby (South Australia)
Cann, Mr B. H. Assistant Government Printer—Technical Services, Department of Administrative Services
Carlisle Mr R. D. Private Citizen
Carr, Captain N. R. Director, Ports and Marine Operations, Department of Marine and Harbors
Carr, Ms T. E. Craftsman, Crafts Council of Western Australia
Carruthers, Mr I. Director, Hazardous Chemicals Section, Environment Assessment Number 2 Branch, Department of Science and the Environment; also as Director, Chemicals Notification and Assessment Section, Environment Assessment Branch, Department of Home Affairs and Environment
Christiansen, Mr B. F. Principal Chemist, Capital Territory Health Commission
Clark, Dr P. D. Health Services Co-ordinator, South Australian Health Commission
Cole, Mr D. A. Executive Member, Conservation Council of South Australia Inc.
Conacher, Mrs J. L. Organic Growers Association W.A. (Inc.)
Cooke, Mr H. D. Dean, Faculty of the Arts, Adelaide College of the Arts and Education
Cordner, Mr J. P. Member, Environment Sub-committee, Australian Chemical Industry Council; also as President, Australian Chemical Industry Council

Cranswick, Mr M. A. First Assistant Secretary, Trade Practices and Consumer Affairs Division, Department of Business and Consumer Affairs
Creighton, Dr W. B. Faculty of Law, University of Melbourne
Crowe, Dr A. J. Adviser in Occupational Health, Capital Territory Health Commission
Cummings, Mr B. J. Project Officer, Queensland Conservation Council
Cumpston, Dr A. G. Medical Liaison Officer, Occupational Health Section, Social Health Branch, Department of Health
Dash, Mr R. M. Acting Co-ordinator of Public Health Services, Health Commission of New South Wales
Davies, Dr R. E. Chairman, Health Committee, Agricultural and Veterinary Chemicals Association of Australia
Dawson, Mr P. J. Assistant Secretary, Policy Development, Purchasing Division, Department of Administrative Services
Deacon, Ms S. Research Officer, Clothing and Allied Trades Union of Australia
Dunn, Mr R. J. Jnr. Director, Environment Protection Section, Department of the Capital Territory
Dyer, Mr L. W. H. Director, Policy Secretariat, Strategic Planning and Resource Allocation Division, Department of Transport
Eccles, Mr P. B. First Assistant Secretary, Coastal Services Division, Department of Transport
Elliott, Mr R. R. F. Chief Marine Surveyor, Marine Standards Division, Department of Transport
England, Dr J. D. F. Private Citizen
Erickson, Miss D. President, Crafts Council of Western Australia
Faichney, Mr G. D. Assistant Commissioner, Policy and Planning, Capital Territory Health Commission
Ferguson, Professor D. A. Acting Director, Commonwealth Institute of Health, Professor of Occupational and Environmental Health, University of Sydney
Francis, Mr T. W. President, Asbestos Diseases Society Inc.
Freeman, Mr W. Chief Executive Officer, Australian Chemical Industry Council
Gandevia, Professor B. H. Associate Professor in Thoracic Medicine, Prince Henry Hospital, University of New South Wales
Gascoine, Mr D. F. Assistant Secretary, Environment Assessment Number 2 Branch, Department of Science and the Environment; also as Assistant Secretary, Environment Assessment Branch, Department of Home Affairs and Environment
Gilmour, Mr J. J. Executive Officer, Environment Unit, Northern Territory Conservation Commission
Gilmour, Mr L. A. Director, Policy Projects, Purchasing Division, Department of Administrative Services
Gray, Dr D. A. Post-graduate student, School of Australian Environmental Studies, Griffith University
Grayson, Mr H. A. Federal President, Royal Australian Chemical Institute
Hedley, Mr A. R. Acting First Assistant Secretary, Legislation and Policy Coordination, Department of the Capital Territory
Henry, Dr M. P. Private Citizen
Hill, Mr D. G. Deputy Director, Australian Conservation Foundation
Hillier, Mrs N. Member, Botany Bay Sub-Region Community Advisory Committee
Hollingworth, Mr G. A. Chairman, Environment Sub-committee, Australian Chemical Industry Council
Hosking, Dr J. W. Chairman, Safety Committee, Western Australian Branch, Royal Australian Chemical Institute
Howe, Dr R. Group Chief Medical Officer, Australian Iron and Steel Proprietary Limited, Hoskins Kembla Works (Port Kembla)
Hughes, Mr H. President, Western Australian Branch, Royal Australian Chemical Institute
Humphry, Dr N. F. Honorary Secretary-General, Australian and New Zealand Society of Occupational Medicine
Jablonski, Mr R. Secretary, National Consultative Committee on Occupational Safety and Health, Department of Science and Technology

Johnson, Mr G. W. Assistant Secretary, Trade Practices Operations, Department of Business and Consumer Affairs
Jones, Mr A. T. Assistant Secretary, Regular Public Transport Branch, Flying Operations and Airworthiness Division, Department of Transport
Jones, Mr R. Second Officer, Industrial Hygiene Branch, Division of Occupational Health and Radiation Control, Health Commission of New South Wales
Kalafatis, Mr. A. Health and Safety Officer, Amalgamated Metal Workers and Shipwrights Union, New South Wales State Office
Keary, Mr J. D. First Assistant Director, Awards Division, Industrial Relations Bureau
Kelly, Mr W. Office Co-ordinator, Friends of the Earth (Sydney)
Kilmartin, Mr J. P. Director of Hazardous Materials, Department of Minerals and Energy (Victoria)
Kilpatrick, Dr D. J. Industrial Scientist, Workers' Health Centre (Victoria)
Knight, Mr J. W. Assistant Secretary, Standardisation and Cataloguing, Department of Defence
Kusnik, Mr J. Ceramic expert, Crafts Council of Western Australia
Langsford, Dr W. A. First Assistant Director-General, Public Health Division, Department of Health
Lavey, Mr N. J. Senior Assistant Engineer, Darwin City Council
Learoyd, Dr B. M. President, New South Wales Branch, Doctors Reform Society
Leggo, Mrs J. Counsellor, Nursing Mothers' Association of Australia
Lewis, Dr J. E. General Superintendent Coke Ovens, Australian Iron and Steel Proprietary Limited, Hoskins Kembla Works (Port Kembla)
McCalman, Ms V. Branch Organiser, Federated Miscellaneous Workers' Union of Australia (Victorian Branch)
McCullagh, Dr P. J. Private Citizen
McCullagh, Dr S. F. President, Australian and New Zealand Society of Occupational Medicine
MacDonnell, Mr J. H. Acting Assistant Secretary, Property Directorate, Department of Administrative Services
McGregor, Mr E. M. Chief Investigations Officer, Environment Protection Authority (Victoria)
McGuffog, Mr D. R. Director and Chairman of Agricultural and Veterinary Chemicals Association of Australia, Clearance and Registration Committee
McIntyre, Mr A. W. D. Solicitor, Australian Iron and Steel Proprietary Limited, Hoskins Kembla Works (Port Kembla)
McLauchlan, Mrs J. Counsellor, Nursing Mothers' Association of Australia
McLean, Mr I. R. Assistant Superintendent Industrial Relations, Australian Iron and Steel Proprietary Limited, Hoskins Kembla Works (Port Kembla)
McMillan, Mr W. T. Lawyer Advising, Queensland Conservation Council
MacPhee, Dr D. G. Private Citizen
McWhirter, Dr W. R. Chairman, Childhood Malignancy Committee, Queensland Childhood Malignancy Registry
Magee, Professor R. J. Professor of Chemistry, La Trobe University, and Chairman, University Safety Committee, La Trobe University
Makeham, Mr P. M. Acting Assistant Secretary, Road Transport Branch, Land Transport Policy Division, Department of Transport
Marks, Mr S. Workers Compensation Officer, Amalgamated Metal Workers and Shipwrights Union (Victoria)
Martin, Mr R. S. Director, Industrial Safety, Department of Mines and Energy
Mathews, Dr J. Research Officer and Director of the Australian Council of Trade Unions —Victorian Trades Hall Council Occupational Health and Safety Unit
Mawer, Mr G. A. Acting Assistant Secretary, Policy Secretariat, Department of Defence
Merton, Mr J. R. Assistant Secretary, Food Services Branch, Agriculture and Food Services Division, Department of Primary Industry
Micallef, Mr E. Occupational Health and Safety Officer, Amalgamated Metal Workers and Shipwrights Union (Victoria)
Miller, Mr G. J. Member and Scientific Adviser, Queensland Conservation Council
Moore, Mr J. W. Acting Assistant Secretary, Operations Branch, Transport and Storage Division, Department of Administrative Services

Morgan, Mr A. J. Member, Toxic Substances Committee, Royal Australian Chemical Institute
Morison, Mr I. W. Assistant Secretary, Radioactive Materials Branch, Department of National Development and Energy
Murray, Mr R. J. Director, City Parks Administration, Department of the Capital Territory
Newman, Mr A. B. Supervisor, Willawong Liquid Waste Disposal Pty. Ltd.
Nicol, Mr T. D. Vice President and Acting Secretary, United Pest Control Association (New South Wales)
Nihill, Mr F. Director, Technical, Agricultural and Veterinary Chemicals Association of Australia
Norris, Mr R. C. Australian Government Analyst, Department of Science and the Environment
Nossar, Dr G. Consultant, Friends of the Earth (Sydney)
O'Brien, Mr T. R. Director, Chemicals Control and Secretariat Section, Environment Assessment Branch, Department of Home Affairs and Environment
Ogilvie, Mr R. Senior Scientific Officer, Division of Inspection Services, Department of Industrial Relations (New South Wales)
Olsson, Mr J. E. Project Officer, Department of Industrial Affairs and Employment (South Australia)
Palmer, Mr A. R. Deputy Secretary, Department of Administrative Services
Panizza, Mr D. J. Superintendent, South Australian Fire Brigade
Peacock, Mr M. J. Private Citizen
Peters, Dr F. E. Executive Committee Member, Canberra Consumers Inc.
Pollak, Dr J. K. Member of Toxic and Hazardous Chemicals Committee of the Total Environment Centre
Porter, Mr W. E. Health Surveyor, City of Canning, Local Goverment Association of Western Australia
Pratt, Dr B. H. Director, Conservation and Agriculture Branch, Department of the Capital Territory
Pratt, Mr B. T. Scientific Officer, Research Unit, Country Fire Authority (Victoria)
Quickenden, Dr T. I. Department of Physical and Inorganic Chemistry, University of Western Australia
Quinn, Dr J. V. Assistant Secretary, Environmental Health Division, Northern Territory Department of Health
Quinn, Mr S. M. State Organiser, Amalgamated Metal Workers and Shipwrights Union, and District Secretary, Wollongong Branch of the Amalgamated Metal Workers and Shipwrights Union.
Roberts, Mr G. H. President, Port Kembla Branch, Federated Ironworkers Association
Rogers, Mr P. L. Brisbane Organic Growers Group
Rooke, Mrs S. M. University Safety Officer, La Trobe University, and Secretary, University Safety Committee, La Trobe University
Rosen, Dr R. Radiation Protection Officer, University of New South Wales
Rowe, Mr R. C. Senior Superintendent, Fire Control Division, South Australian Fire Brigade
Ruschena, Mr L. J. Senior Occupational Hygienist, Occupational Health Division, State Electricity Commission of Victoria
Sampson, Mr L. H. Post-graduate student, School of Australian Environmental Studies, Griffith University
Savage, Mr G. W. Deputy Chief Health Surveyor, City of Canning, Local Government Association of Western Australia
Scanlan, Mr P. G. Group Manager, Chemical and General Technology Section, Standards Association of Australia
Scott, Dr R. J. Private Citizen
Smith, Mr B. A. Post-graduate student, School of Australian Environmental Studies, Griffith University
Smith, Mr C. H. G. Technical Consultant, Australian Chemical Industry Council
Smith, Mr I. D. B. Post-graduate student, School of Australian Environmental Studies, Griffith University

Smith, Mr S. W. C. Principal Chemist, Toxicology Section, Environmental Health Branch, Department of Health
Smoker, Mr D. R. Radiation Safety Officer, Capital Territory Health Commission
Snelson, Mr J. T. Pesticides Co-ordinator, Pesticides Agricultural Chemicals and Veterinary Drugs Section, Food Services Branch, Agriculture and Food Services Division, Department of Primary Industry
Staunton, Mr I. Secretary, Council of Australian Pest Control Associations, United Pest Control Association (New South Wales)
Stehbens, Mr I. R. Post-graduate student, School of Australian Environmental Studies, Griffith University
Storie, Mr J. V. T. Private Citizen
Suckling, Mr G. University Safety Officer, University of New South Wales
Thirwell, Mr J. A. Manager Personnel, Australian Iron and Steel Proprietary Limited, Hoskins Kembla Works (Port Kembla)
Thistlethwaite, Dr R. J. Assistant Secretary, Technical Services Division, Department of Primary Production (Northern Territory)
Thomas, Mr D. R. Technical Manager, Metropolitan Waste Disposal Authority (New South Wales)
Thompson, Mr K. E. First Assistant Secretary, Environment Division, Department of Science and the Environment
Thorne, Mrs K. P. Assistant Secretary, Royal Australian Chemical Institute
Toovey, Mr D. R. Assistant Secretary, Physical Working Environment Branch, Working Environment Division, Department of Science and Technology; also as Assistant Secretary, Department of Employment and Industrial Relations
Trew, Mr R. N. Post-graduate student, School of Australian Environmental Studies, Griffith University
Voce, Mr L. A. Chief Inspector, Machinery, Department of the Capital Territory
Watson, Mr J. A. Safety Manager, Consolidated Fertilizers Ltd.
Weaver, Mr D. R. Administrative Assistant to the Dean, Faculty of the Arts, Adelaide College of the Arts and Education
Webb, Mr B. Operations Manager, Transport Division, Department of Transport and Works (Northern Territory)
Weedman, Mr D. E. Registrar of Pesticides, Department of Agriculture, (New South Wales)
Westerman, Professor H. L. Chairman, Botany Bay Sub-Region Community Advisory Committee
Williams, Mr J. W. Research Worker, Workers Health Centre (Lidcombe)
Wilson, Mr H. O. Senior Chemist, Water Division, Department of Transport and Works (Northern Territory)
Wood, Mr C. K. Deputy Director, Industrial Relations Bureau
Woodhouse, Mr P. W. Executive Secretary, Royal Australian Chemical Institute
Woodrow, Mr J. First Assistant Secretary, Department of Employment and Industrial Relations
Yates, Mr P. B. Principal Engineer, Water, Wastes and Chemicals Branch, State Pollution Control Commission (New South Wales)
Young, Ms P. Research Officer, Workers' Health Centre, (Victoria)

APPENDIX 3

LIST OF SUBMISSIONS

Persons and organisations who have made submissions but did not appear at public hearings.

ACT Fire Brigade
Agricultural Technologists of Australasia
Anti Cancer Council of Victoria
Australasian College of Dermatologists
Australian Community Health Civil Rights Association
Australian Fire Protection Association Ltd
Australian Institute of Petroleum Ltd
Australian National Line
Australian National Railways Commission
Australian Pharmaceutical Manufacturers Association
Baker, Dr R. S. U., Lane Cove, N.S.W.
Barker, Mr J. D., Camp Hill, Qld
Barr, Dr M., Melbourne
Beacroft, Mr D. F., Page, A.C.T.
Bureau of Sugar Experiment Stations
Burrows, Mr F., Lidcombe, N.S.W.
Carroll, Ms B., Murwillumbah, N.S.W.
Centre for Environmental Studies, University of Adelaide
Commonwealth Scientific and Industrial Research Organisation
Community Action on Science and the Environment
Corke, Mrs J., East Hawthorn, Vic.
Crafts Council of the A.C.T.
Crawford, Dr P. J.
Department of Housing and Construction
Doddrell, Professor D. M., Griffith University
Esso Australia Ltd
Eva, Mr R. A., Caloundra, Qld
Federated Moulders; (Metals) Union of Australia (N.S.W. Branch)
Federated Municipal & Shire Employees Union of Australia, Victoria Division
Federated Miscellaneous Workers' Union of Australia
Flick, W.A. and Co.
Food Justice Centre, Vic.
Geelong Church of England Grammar School
Gillies, Ms R., Pennant Hills, N.S.W.
Goodwin, Mr J., Zillmere, Qld
Haslem, Ms A., Innisfail, Qld
Heathcote Citizens Action Committee
Jeffery, Mr B., Maroochydore, Qld
Keen Pour Industries
Kodak (Australasia) Pty. Ltd
Lara Environment Action Group
Latrobe Valley Water and Sewerage Board
Leeder, Professor S., University of Newcastle
Lees, Mr J. J., McDowall, Qld
Lowe, Mrs A.M., Lowther, N.S.W.
Lower Burns Bay Road Association
Major, Mr G., Wahroonga, N.S.W.
McGrath, Ms A., Lisarow, N.S.W.

Mentone and Cheltenham Residents Action Group for Clean Air
Mills, Mr L., Nowra, N.S.W.
Minister for Education
Minister for Immigration and Ethnic Affairs
Minister for Industry and Commerce
Minister for Post and Telecommunications
Morice, Dr R., New Town, Tas.
National Council of Women of Australia
National Farmers Federation
Nationwide Recovery Systems Pty. Ltd
Nazer, Mr C. J., Page, A.C.T.
Nedlands College of Advanced Education
Non-Smokers Movement of Australia
Opit, Professor L., Monash University
Poyser, Ms D., Hawthorn, Vic.
Preston Institute of Technology
Qantas Airways Limited
Sheedy, Mr T. J., Department of Science, Newcastle College of Advanced Education
Shire of Corio
Sibatani, Dr A., North Ryde, N.S.W.
South Australian Country Women's Association Inc.
Technical Service Guild of Australia
Telecom Australia
The Cancer Institute, Peter McCallum Hospital
The University of Queensland
Thornely, Mr A. T., Kerang, Vic.
Thorpe, Mr K. J., Dee Why, N.S.W.
Trans-Australia Airlines
United Firefighters Union, Victorian Branch
United Firefighters Union
Victorian College of Pharmacy
Waid, Professor J. S., La Trobe University
Webster, Professor I., University of New South Wales
Wells, Ms V. V., Altona, Vic.
Western Australian Institute of Technology
Wide Bay—Burnett Conservation Council
Wildes, Mr H. W., Carnegie, Vic.

APPENDIX 4

RECOMMENDATIONS OF AEC WORKING GROUP ON ENVIRONMENTALLY HAZARDOUS CHEMICALS, 1977

1. A mechanism should be established by the AEC for assessment of chemicals for potential environmental effects. This procedure for assessment should be implemented in close liaison with and complementary to the related procedures of the National Health and Medical Research Council and the Australian Agricultural Council.

2. The assessment procedure should provide a basis for determining the conditions of control of a chemical so as to minimise the risk of environmental hazard without unnecessarily restricting the social benefits of use or innovation in industry.

3. Imported and locally manufactured chemicals should be subjected to equivalent assessment.

4. The onus for implementing environmental test programs for providing an initial assessment of chemicals to the AEC Assessment panel should lie with industry. Industry should conduct an environmental assessment of chemicals and as a general rule these test programs should be carried out as an integral part of its research and development programs. Where required, industry should notify results of testing programs and an assessment of the results to the AEC Assessment body. (See also Recommendation 8.)

5. The AEC should encourage the development of arrangements for independent confirmatory testing on specific chemicals or specialised testing, under particular environmental conditions, where deemed necessary.

6. Long term environmental monitoring of chemicals in accordance with specified priorities should be undertaken in large measure through government activities. Governments should be invited to pursue such monitoring. Industry must also undertake long term monitoring, particularly with reference to effluent from industrial processes, accidential releases of chemicals to the environment and disposal of chemical wastes.

7. The mechanism established by the AEC for assessment of chemicals should be comprehensive and should provide in principle for evaluation of all new and existing chemicals. In practice, especially in the initial stages, a selective approach to assessment of chemicals should be adopted.

8. Information provided by industry should be in accordance with guidelines laid down by the AEC assessment body. These guidelines should enable industry to draw on acceptable overseas data to the maximum extent.

9. To make the most efficient use of resources, notification of information by industry should be carried out in two phases; an initial notification and, where this information indicates a potential environmental hazard, this would be followed by a more detailed second stage notification of information on environmental effects.

10. A national register of chemicals should be established to disseminate information within Australia as required. Priority should be given to development of a listing of environmentally hazardous chemicals within the register.

11. The Commonwealth should be invited to review existing procedures for collecting statistical information on environmentally hazardous chemicals so as to provide the information in a form deemed necessary by the AEC assessment body.

12. The Commonwealth, States and Territories, on the basis of the recommendations of the AEC assessment body should adopt a procedure of listing and regulation of environmentally hazardous chemicals.

13. The AEC assessment body should on invitation evaluate information on those chemical processes which State and Territory authorities consider may present a potential environmental hazard. Where a process is deemed to present a potential hazard, recommendations on regulatory action should be developed by the assessment body.

14. Consistent with the recommendations of the AEC, the Commonwealth should apply equivalent controls to imports and exports of environmentally hazardous chemicals as to locally manufactured chemicals.

15. The AEC should consult with bodies responsible for establishing labelling and packaging requirements to seek integrated labelling procedures which include provision for environmental hazard.

16. The AEC should invite ATAC to review the transport of environmentally hazardous chemicals by all transport modes.

17. Authorities having responsibility for emergency services should be invited to review procedures covering accident or spill of chemicals to make provision for prompt notification of the event to the appropriate environmental and other authorities.

18. To prevent their release to the environment in the event of an accident or spillage, authorities responsible for controlling storage of environmentally hazardous chemicals should be invited to review the provisions for their containment. As part of the information notification procedure, the AEC assessment body should seek details on the proposed methods of storage of a chemical and should make recommendations on the conditions of storage as appropriate.

19. Where appropriate, restriction on public sale of environmentally hazardous chemicals should be applied.

20. The environmental effects of disposal of a chemical should be considered as part of the assessment procedure. In the normal course of events the onus should lie with the manufacturer to devise an acceptable disposal procedure. If adequate disposal methods for hazardous chemicals or their degradation products cannot be shown to be available, then its manufacture, import and sale should be prohibited. For some types of chemical wastes, disposal requirements need to be examined by the producers of the waste on a national scale.

21. Persons or companies transporting environmentally hazardous chemicals or wastes containing such chemicals should be licensed.

22. The AEC through its assessment body should continue consultations with industry on the development of a code of practice for environmentally hazardous chemicals.

23. The AEC should continue consultations with the SAA concerning extension of work on standards and codes of practice to cover environmental effects of chemicals.

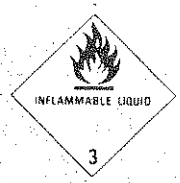
24. Each member of the AEC should have the right to nominate an expert representative (either government or non-government) to the AEC assessment body. In addition, the National Health and Medical Research Council and the Australian Agricultural Council should be invited to nominate a member. Reciprocal membership of the AEC on appropriate bodies of other Councils should be encouraged. The assessment body should also have the ability to co-opt members from government, industry, consumer bodies or academic institutions.

The assessment body may need to establish working groups to handle particular issues.

25. The Commonwealth should be invited to provide a technical secretariat to support the operations of the AEC assessment body, as has been done in the case of the assessment procedures conducted by the NH & MRC and AAC. The technical secretariat would also operate the national register of chemicals. It would need to have adequate funds, expertise and ready access to computing facilities.

26. Governments should be invited to examine their present legislative and administrative machinery to see that it is consonant with the approach adopted by the AEC.

EMERGENCY PROCEDURE GUIDE — TRANSPORT



LABEL 3

STYRENE MONOMER

Clear colourless liquid with a pungent odour.
Does not mix with water.
Vapour is heavier than air.
Carried in tankers, drums and small containers.

Fire Exposure	**HAZARDS** *Liquid and vapour highly flammable.* *Vapour forms explosive mixtures with air.* *Heat may cause violent rupture of container.* *Vapour causes dizziness and drowsiness.* *Liquid and vapour will irritate eyes, throat, lungs and skin.*

EMERGENCY PROCEDURES

If this happens	Do this
Spill or leak	Shut off engine and any electrical equipment and leave 'off' until vapour hazard is removed. No smoking or naked lights within 70 metres. Move people from the area. Move upwind. Avoid breathing vapour. Dont allow liquid to contact skin or eyes. Stop leaks if possible. Prevent spillage from spreading or entering underground drains by banking with sand or earth. Inform the fire brigade and police.
Fire	Shut off engine and any electrical equipment and leave 'off' until vapour hazard is removed. Put out fire with CO_2, dry powder, vapourizing liquid or foam extinguisher, or water delivered as a fine spray, if available. Move people from the area. Move upwind. Send messenger to notify fire brigade and police. Tell them location, material and quantity. If available, play water on containers to keep cool. Remove containers from vehicle if not in area of fire, or remove other material to prevent spread of fire to containers. If fire gets out of control, evacuate area and warn against entry.

Published by the Standards Association of Australia on 1 February 1979.

READ OTHER SIDE

If this happens	Do this
Tanker/Vehicle Accident	Shut off engine and any electrical equipment and leave 'off' until vapour hazard is removed. Move people from the area. Move upwind. Check for spills or leaks. Send messenger to notify fire brigade and police. Tell them location, material and owner. Indicate condition of vehicle and any damage observed. Dont move vehicle if movement could cause spillage. If vehicle is on fire, evacuate area and warn against entry.

FIRST AID

Gassing	Remove patient to fresh air, lay down, rest. If patient is not breathing, make sure airway is clear and apply artificial respiration. Oxygen may be given, but only under supervision of a trained person. Keep patient warm. Call doctor at once or transport to doctor or hospital.
Eyes	Hold eyes open and wash continuously with water for at least 15 min. Transport to doctor or hospital.
Skin	Remove all contaminated clothing, including shoes. Wash affected areas with water using soap, if available.

EMERGENCY CONTACT

Organization	Location	Telephone*	Ask for

* Include area code in brackets.

READ OTHER SIDE

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
CLASSIFICATION, HAZARD IDENTIFICATION AND INFORMATION SYSTEMS FOR DANGEROUS GOODS

Part 3

NFPA HAZARD IDENTIFICATION SYSTEM

SECTION 1. SCOPE, APPLICATION AND DEFINITIONS

1.1 SCOPE. This standard explains the hazard identification system developed by the National Fire Protection Association (NFPA) of the U.S.A.

The NFPA symbol for a substance gives a quick visual indication of the degree of hazard associated with that substance in the fields of health, flammability and reactivity. It also provides for an indication of certain other special hazards which may be associated with a substance.

Although the system has been developed by the NFPA primarily as an aid to personnel fighting fires, it has much wider application. It it here recommended that the primary reference for the emergency services should be the HAZCHEM emergency action code which is the subject of AS 1216, Part 2.

It must also be stressed that neither the NFPA symbol nor the HAZCHEM code are substitutes for full safety information on a substance.

1.2 APPLICATION. The purpose of this standard is to facilitate the understanding and use of the NFPA hazard identification system, so that persons handling and storing dangerous goods, those responsible for such operations, and emergency service personnel will have the benefit of a rapid visual indication of hazards. This will require supplementation by fuller and more complete sources of information obtained from elsewhere.

The underlying purpose is to minimize the risk to life and property from the hazardous properties possessed by many chemicals.

1.3 DEFINITIONS. For the purpose of this standard, the following definitions apply:

1.3.1 Hazard—a physical situation with a potential for harm to life, health or property.

1.3.2 Health hazard—any property of a material which either directly or indirectly can cause injury or incapacitation, either temporary or permanent, from exposure by contact, inhalation or ingestion.

1.3.3 Risk—

(a) the probability that a hazard may be realized at a specific level in a given span of time; or

(b) the probability that an individual may suffer a specified level of injury as a result of a hazard, in a given span of time.

1.3.4 Reactive material—a material which can enter into a chemical reaction with other stable or unstable materials. For the purposes of this standard, the other material to be considered is water and only if its reaction releases energy. Reactions with common materials, other than water, may release energy violently. Such reactions must be considered in individual cases, but are beyond the scope of this identification system.

1.3.5 Unstable material—a material which in the pure state or as commercially produced will vigorously polymerize, decompose or condense or become self-reactive and undergo other violent chemical changes.

Stable materials are those that normally have the capacity to resist changes in their chemical composition, despite exposure to air, water and heat as encountered in fire emergencies.

SECTION 2. DESCRIPTION OF NFPA SYMBOL

2.1 DESCRIPTION OF SYMBOL. The NFPA symbol is a diamond shaped diagram subdivided into four diamond shaped parts as shown in Fig. 2.1.

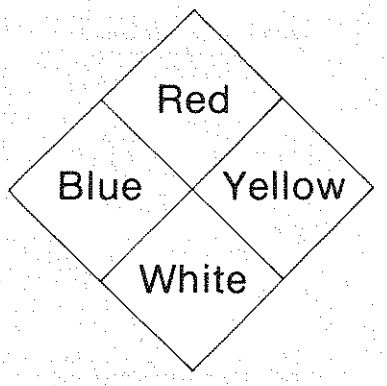


Fig. 2.1. NFPA SYMBOL

The red, yellow and blue diamonds carry 'signals' indicating the degree of hazard in each of the three main fields of hazard, viz flammability, reactivity, and health. These signals are in the form of numerals from 0 to 4; 0 indicating no special hazard up to 4 indicating extreme danger.

The white diamond may carry the following:

(a) ₩ indicating a possible hazard in the use of water.

(b) OXY indicating an oxidizing chemical.

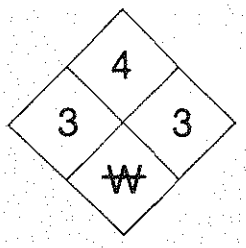
(c) A trefoil symbol indicating a radiation hazard.

Table 2.1 further describes the layout of the symbol. Examples illustrating the systems are shown in Fig. 2.2.

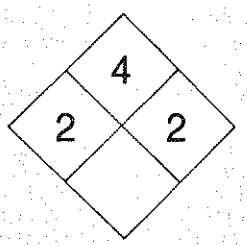
TABLE 2.1

LAYOUT OF NFPA SYMBOL

Orientation	Colour	Hazard field	Signals for degree of hazard
12 o'clock	Red	Flammability	0, 1, 2, 3, 4 Increasing hazard
3 o'clock	Yellow	Reactivity	0, 1, 2, 3, 4 Increasing hazard
6 o'clock	White	Special	Special symbols
9 o'clock	Blue	Health	0, 1, 2, 3, 4 Increasing hazard



Diborane



Vinylidene Chloride

Fig. 2.2. EXAMPLES OF NFPA SYSTEM

2.2 SUMMARY OF HAZARD SCALES. The NFPA hazard scales are summarized in Table 2.2.

TABLE 2
HAZARD SCALES

Identification of health hazard Colour code: Blue		Identification of flammability Colour code: Red		Identification of reactivity (stability) Colour code: Yellow	
Type of possible injury		Susceptibility of materials to burning		Susceptibility to release of energy	
Signal		Signal		Signal	
4	Materials which on very short exposure could cause death or major residual injury even though prompt medical treatment was given.	4	Materials which will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature, or which are readily dispersed in air and which will burn readily.	4	Materials which in themselves are readily capable of detonation or of explosive decomposition or reaction at normal temperatures and pressures.
3	Materials which on short exposure could cause serious temporary or residual injury even though prompt medical treatment was given.	3	Liquids and solids that can be ignited under almost all ambient temperature conditions.	3	Materials which in themselves are capable of detonation or explosive reaction but require a strong initiating source or which must be heated under confinement before initiation or which react explosively with water.
2	Materials which on intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical treatment is given.	2	Materials that must be moderately heated or exposed to relatively high ambient temperature before ignition can occur.	2	Materials which in themselves are normally unstable and readily undergo violent chemical change but do not detonate. Also materials which may react violently with water or which may form potentially explosive mixtures with water.
1	Materials which on exposure would cause irritation but only minor residual injury even if no treatment is given.	1	Materials that must be preheated before ignition can occur.	1	Materials which in themselves are normally stable, but which can become unstable at elevated temperatures and pressures or which may react with water with some release of energy but not violently.
0	Materials which on exposure under fire conditions would offer no hazard beyond that of ordinary combustible material.	0	Materials that will not burn.	0	Materials which in themselves are normally stable, even under fire exposure conditions, and which are not reactive with water.

O.S.H.A. Material Safety Data Sheet Form

MATERIAL SAFETY DATA SHEET

I PRODUCT IDENTIFICATION	
MANUFACTURER'S NAME	REGULAR TELEPHONE NO. EMERGENCY TELEPHONE NO.
ADDRESS	
TRADE NAME	
SYNONYMS	

II HAZARDOUS INGREDIENTS		
MATERIAL OR COMPONENT	%	HAZARD DATA

III PHYSICAL DATA			
BOILING POINT, 760 MM HG		MELTING POINT	
SPECIFIC GRAVITY (H_2O=1)		VAPOR PRESSURE	
VAPOR DENSITY (AIR=1)		SOLUBILITY IN H_2O, % BY WT	
% VOLATILES BY VOL		EVAPORATION RATE (BUTYL ACETATE =1)	
APPEARANCE AND ODOR			

IV FIRE AND EXPLOSION DATA

FLASH POINT (TEST METHOD)		AUTOIGNITION TEMPERATURE	
FLAMMABLE LIMITS IN AIR, % BY VOL.	LOWER		UPPER
EXTINGUISHING MEDIA			
SPECIAL FIRE FIGHTING PROCEDURES			
UNUSUAL FIRE AND EXPLOSION HAZARD			

V HEALTH HAZARD INFORMATION

HEALTH HAZARD DATA

ROUTES OF EXPOSURE

INHALATION

SKIN CONTACT

SKIN ABSORPTION

EYE CONTACT

INGESTION

EFFECTS OF OVEREXPOSURE

ACUTE OVEREXPOSURE

CHRONIC OVEREXPOSURE

EMERGENCY AND FIRST AID PROCEDURES

EYES

SKIN

INHALATION.

INGESTION

NOTES TO PHYSICIAN

VI REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY

INCOMPATIBILITY

HAZARDOUS DECOMPOSITION PRODUCTS

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION

VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED

NEUTRALIZING CHEMICALS

WASTE DISPOSAL METHOD

VIII SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS

SPECIFIC PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY (SPECIFY IN DETAIL)

EYE

GLOVES

OTHER CLOTHING AND EQUIPMENT

IX SPECIAL PRECAUTIONS

PRECAUTIONARY STATEMENTS

OTHER HANDLING AND STORAGE REQUIREMENTS

PREPARED BY _____

ADDRESS _____

DATE _____

Code of General Principles

Occupational Safety and Health in Australian Government Employment

CONTENTS

FOREWORD

On 10 September 1974, the Australian Government agreed that Ministers direct departments and statutory authorities for which they have responsibility, to apply the Code of General Principles on Occupational Safety and Health in Australian Government Employment.

The Department of Labor and Immigration has responsibility for the general oversight in relation to the implementation of the Code except for occupational health recommendations which will be determined by the Director-General of Health, Department of Health.

The purpose of this Code is to protect persons employed by the Australian Government from accidental injury and to promote the maximum degree of health and well being. Because any work injury results from inter-reaction between a worker and his or her working environment, there is no such thing as absolute safety. Maximum safety cannot be ensured by control of the environment alone but demands the understanding and co-operation of all persons at all levels.

Consequently the Code provides not only for the control of the physical environment, but for training, consultation between management and employees, and their maximum involvement in all accident prevention measures.

The Code also defines the responsibilities of persons at all levels in departments and instrumentalities in the promotion of safety and good working conditions.

Only two categories of persons are recognised; head officers and employees. The latter term therefore includes persons at all levels in the service, all of whom are seen as having responsibilities for safety commensurate with their positions.

While the Code of General Principles defines responsibilities for safety and health and states in broad terms the action that shall be taken to fulfil them, it does not provide detailed information on the standards required.

This information is to be provided in the corresponding detailed provisions. These will be collated from accepted standards and codes of practice, recommendations agreed by the State Departments of Labour, State regulations and other information as applicable. The detailed provisions will be issued as separate publications.

These provisions will be taken as providing the criteria by which observance of the Code is to be judged.

SECTION 1

SCOPE AND DEFINITIONS

1.1 Scope

This Code lays down the measures required by the Australian Government to safeguard the safety and health of all employees of the Australian Government while they are at work and wherever they may be working.

1.2 Definitions

In this Code the following definitions apply:

1.2.1 Department — any department of the Australian Government. For the purpose of this code, any establishment, undertaking, etc., under the control of a permanent head of a department is considered as part of that department.

1.2.2 Instrumentality — any agency of the Australian Government, other than a department, reporting to a Minister of the Australian Government.

1.2.3 Head Officer — the permanent head of a department, or the chief functional officer of an instrumentality.

1.2.4 Employee — a person of any classification or grade employed by any department or instrumentality and engaged in activities for which he receives direct payment.

1.2.5 Accident — any event arising out of employment which results in work injury, damage to property or the possibility of such injury or damage to property.

1.2.6 Work Injury — any injury, poisoning, disease or disability to an employee, or the recurrence or exacerbation of any such injury, disease, or disability, which arises out of employment.

1.2.7 Safe, Safety — the condition in which persons are protected from the risk of work injury so far as is practicable in the light of current knowledge, through control of the working environment, work methods, machinery, plant and equipment, and through measures to influence the human factors conducive to accidents and injuries.

1.2.8 Work Place — any place where an employee is required to be or has occasion to go during the course of his employment.

1.2.9 Personal Protective Equipment — clothing and equipment intended to be worn or used by employees and designed to protect against work injury.

SECTION 2

OBLIGATIONS OF HEAD OFFICERS AND EMPLOYEES

2.1 Head Officers

Every head officer shall be responsible for ensuring that the provisions contained in this Code are applied in his department or instrumentality. Measures to be taken shall include:

2.1.1 The issue of a statement of safety policy and responsibilities. (Section 3)

2.1.2 The adoption of arrangements for joint consultation with employees on safety matters. (Section 4)

2.1.3 The appointment of safety co-ordinators. (Section 5)

2.1.4 The provision of safe work places and a safe working environment. (Section 6)

2.1.5 The provision of safe plant, machinery and equipment. (Section 7)

2.1.6 The adoption of safe work methods and appropriate training and placement of employees. (Section 8)

2.1.7 The adoption of occupational hygiene principles and control of harmful chemical and physical agents. (Section 9)

2.1.8 The adoption of measures to minimise the risk of, and harmful effects of, fire and explosion. (Section 10)

2.1.9 The provision of appropriate personal protective equipment and the adoption of measures to ensure its proper use. (Section 11)

2.1.10 The establishment of medical, health and first-aid services. (Section 12)

2.1.11 The maintenance of injury and accident records and arrangements for accident investigation. (Section 13)

2.2 Employees

2.2.1 Each employee shall have responsibility for safe working consistent with the extent of his control over or influence on working conditions and methods.

2.2.2 Each employee shall take such action as is within his competence and responsibility or report or make such recommendation to a higher level as he deems necessary to avoid, eliminate, or minimise hazards of which he is aware in regard to working conditions or methods.

2.2.3 Each employee shall observe all instructions issued to protect his safety or the safety of others.

2.2.4 Each employee shall make proper use, or to the extent of his responsibility ensure that proper use is made, of all safeguards, safety devices, personal protective equipment and other appliances provided for safety purposes.

2.2.5 No employee shall, or shall cause another employee to, interfere with, remove, displace or render ineffective any safeguard, safety device, personal prctective equipment or other appliance provided for safety purposes, except when necessary as part of an approved maintenance or repair procedure.

SECTION 3

STATEMENT OF SAFETY POLICY AND RESPONSIBILITIES

Each head officer shall issue and disseminate throughout his department or instrumentality a written statement of safety policy which he shall periodically review, expressing the aim of safe working, the requirement to comply with the provisions of this Code and in broad terms, the means by which compliance will be achieved and maintained.

The statement shall indicate:

- the obligations and responsibilities of employees at all levels (Section 2.2)
- the provisions for employee consultation and participation in safety activities (Section 4)
- the provisions for co-ordination of safety activities (Section 5).

SECTION 4

ARRANGEMENTS FOR JOINT CONSULTATION WITH EMPLOYEES ON SAFETY MATTERS

4.1 Each head officer shall ensure that arrangements for safety within his department or instrumentality provide for the participation of employees at all levels, in planning and implementing safety policy.

Measures shall include:

4.1.1 The establishment of an occupational safety and health committee on policy, which will include management, trade union and other employee representatives. This committee should have oversight of executive action taken to implement the policy.

4.1.2 The establishment of occupational safety and health committees at executive and operational levels, which will include management, trade union and other employee representatives, except where the nature of the work, the number of employees or other organisational circumstances render the operation of such committees inappropriate, in which case other standing arrangements agreed by management and the employees concerned shall be made for joint consultation and action.

4.1.3 Consultation with appropriate employee representatives on particular problems of safety and health.

4.1.4 Keeping all employees informed on accident prevention activities through such measures as written communications, meetings, lectures, films, departmental newsletters and other means of communications.

SECTION 5

SAFETY CO-ORDINATION

5.1 Safety Co-Ordination Responsibility

Responsibility for safety co-ordination throughout the department or instrumentality shall be included in the functions of a senior management position having direct access to the head officer or his deputy.

5.2 Safety Co-Ordination Duties

Safety co-ordination duties shall include:

5.2.1 Formulation and implementation of plans to promote interest in and action on safety.

5.2.2 Surveillance of accident and injury experience.

5.2.3 Inspections of work areas, continual reviews of safety measures.

5.2.4 Study and dissemination of relevant information on safety from sources both inside and outside the department or instrumentality.

5.2.5 Advice to all levels of management on safety matters.

5.2.6 Preparation of an annual report on safety experience and performance.

5.3 Safety Officers

To carry out these duties the head officer shall, as necessary, appoint other officers who may be employed either full-time on safety or in association with other duties. The number of such officers, their qualifications and classifications and their full or part-time assignment shall be consistent with the size of the department or instrumentality, the geographic scatter of its locations and the nature of its operations and hazards.

SECTION 6

WORKPLACES AND THE WORKING ENVIRONMENT

6.1 Working Environment

Head officers shall ensure that every practicable measure is taken to provide a safe and healthy working environment for employees both in fixed locations and in temporary and outdoor locations.

6.2 Buildings and Workplaces

Buildings and where practicable workplaces, shall be planned, designed, constructed, prepared and maintained so that:

6.2.1 Structures have adequate strength and stability.

6.2.2 Working surfaces are adequately drained and provide good foothold.

6.2.3 Adequate working space is provided for operational and maintenance work with a minimum of congestion, obstruction to movement or risk of collision.

6.2.4 Order, cleanliness and hygienic standards are maintained.

6.2.5 Adequate lighting is provided.

6.2.6 Adequate ventilation and satisfactory thermal conditions are provided.

6.2.7 Safe means of access to and egress from workplaces are provided, including quick egress in case of fire or other emergency and ready access for fire fighting purposes.

6.2.8 There is adequate resistance to the spread of fire and, where appropriate, safe relief of explosion pressure, adequate fire fighting and rescue equipment available, clearly identified and ready for use.

6.2.9 To the greatest extent practicable the design, construction and layout of buildings and workplaces facilitate measures taken to reduce personal exposures to harmful physical and chemical agents.

6.2.10 Electrical, fuel, compressed air, steam or other services are installed in a safe manner.

6.2.11 There are adequate means of communication so that safety, health or rescue needs become known without delay.

6.2.12 Adequate sanitary installations are provided.

6.2.13 The use of materials therein and the use of furniture and fittings are such as to reduce the risk of personal exposure to harmful chemical and physical agents in the event of fire.

6.3 Confined Spaces

Special procedures shall be followed based on written instructions for the safety of persons required to work in confined spaces.

6.4 Isolated Situations

Special measures shall be adopted to protect the safety and health of employees required to work in the field or in isolated situations.

SECTION 7

MACHINERY, PLANT AND EQUIPMENT

7.1 General

Head officers shall ensure that all machinery, plant and equipment is safe including mobile or vehicular machinery, plant and equipment, and portable appliances.

7.2 Protection Against Failure or Faulty Operation

The design, construction, location and maintenance of machinery, plant and equipment shall be such as to minimise the risk of, or the harmful effects of, failure of parts, collapse, bursting, fire, explosion, faulty operation, electrical shock, and exposure to harmful physical and chemical agents.

7.3 Guarding

Portions of machinery, plant and equipment that are not constructed so as to be permanently safe shall be guarded or screened to the greatest practicable extent, and special procedures shall be implemented so as to prevent injury to employees or other persons.

SECTION 8

SAFE WORK METHODS AND APPROPRIATE TRAINING AND PLACEMENT OF EMPLOYEES

8.1 Work Methods

Head officers shall ensure that safe methods of work are established and reviewed from time to time in the light of experience or changed circumstances. Where unusual or serious hazards are involved, the proper methods shall be defined in written instructions.

8.2 Placement of Employees

An employee shall be assigned only to a task which he can perform safely. Where doubt exists, or on request by the employee, he shall be referred for medical examination.

For tasks in which a high degree of operating skill and correct procedures are critical to safety, standards of competence shall be defined and measures taken to ensure that they are met.

8.3 Induction of New Employees

Arrangements shall be made for new employees or employees transferred to new locations, to be instructed in the rules for safe working in their tasks and advised on any particular hazards associated with them.

Special measures shall be taken to ensure that new employees not familiar with the English language fully understand the training given to them.

8.4 Training

Head officers shall ensure that all employees are trained and periodically retrained as necessary, in the safe practice of their employment.

Machinery, plant and equipment, the use of which can involve serious risk of accident or injury to operators or others, shall be operated only by employees specially trained and qualified in its operation.

8.5 Supervision

Head offiers shall provide for competent supervision to ensure that safe procedures are followed and that unsafe methods and hazards in the workplace are corrected.

SECTION 9

OCCUPATIONAL HYGIENE CONTROL OF HARMFUL CHEMICAL AND PHYSICAL AGENTS

9.1 General

Where harmful chemical and physical agents are used, produced, released, transported, stored, handled or otherwise may be present, head officers shall ensure that steps are taken to keep personal exposures to such agents within safe limits and that such steps comply with recommendations of the Director-General of Health.

9.2 Installations and Processes

Head officers shall ensure that when new chemical and physical agents that may be harmful are introduced or when new installations or processes involve the use, generation or release of chemical or physical agents that may be harmful, the use of such agents and the design of such installations or processes shall comply with the recommendations of the Director-General of Health.

9.3 Exposure to Harmful Chemical Agents

No employee shall be exposed to harmful chemical agents, whether by skin contact, inhalation or ingestion at levels exceeding those approved by the Director-General of Health.

9.4 Exposure to Harmful Physical Agents

No employee shall be exposed to harmful physical agents such as dust, noise, vibration, extremes of temperature or radiation except at levels and under conditions approved by the Director-General of Health.

9.5 Measurement of Exposure to Airborne Contaminants

Methods for sampling, measurement and reporting of concentrations of airborne contaminants shall be those approved by the Director-General of Health.

9.6 Controls

Measures for the control of harmful physical and chemical agents to approved levels shall comply with the recommendations of the Director-General of Health.

9.7 Confined Spaces

Safe procedures shall be established for the entry of employees into confined spaces or any location in which air may be contaminated or deficient in oxygen.

Procedures shall govern conditions for pre-entry, occupancy, communication, rescue and first aid.

9.8 Advice to Employees

Where it is possible for employees to be exposed to harmful physical or chemical agents, they shall be informed and reminded of the nature of the agents and their adverse health effects and of any steps they should take to ensure that exposures are kept within safe limits.

SECTION 10

FIRE AND EXPLOSION

10.1 Fire and Explosion Risks

Where combustible, flammable or explosive substances are used, produced, released, transported, stored, handled or otherwise may be present, head officers shall ensure that all reasonable steps are taken to minimise the risk of uncontrolled escape or accumulation of such substances and the risk of ignition or initiation of explosion, and to minimise the spread of fire and the harmful effects of explosion.

10.1.1 Employees who work with or in the vicinity of flammable or explosive substances, shall be informed and reminded of the fire or explosion risk and effectively trained in the steps they should take to avoid such an occurrence.

10.2 Fire Fighting Equipment

10.2.1 In all buildings and workplaces adequate fire-fighting equipment shall be provided together with means for quickly calling community fire fighting services where available.

10.2.2 Where required for the safety of persons, adequate fire detecting equipment shall be provided.

10.2.3 Sufficient employees shall be trained in early fire fighting so that effective use is made of the equipment available.

10.3 Evacuation

In all buildings, and in other work places where appropriate, head officers shall ensure that there is a plan and an organisation for the quick evacuation of employees to safe areas. Employees shall be informed and practice evacuations shall be carried out at appropriate intervals.

SECTION 11

PERSONAL PROTECTIVE EQUIPMENT

11.1 Use of Personal Protective Equipment

Head officers shall ensure that personal protective equipment is supplied for the protection of employees against hazards that cannot be controlled satisfactorily by other means.

11.2 Types and Specifications of Equipment

Personal protective equipment supplied as protection against a particular hazard shall be in accordance with the recommendations of the Director-General of Health.

11.3 Promotion of Use

Head officers shall take measures to ensure the proper use of personal protective equipment including education, instruction and supervision.

11.4 Maintenance of Equipment

Equipment shall be maintained in a clean, hygienic and effective condition and kept readily available for use.

11.5 Equipment For Use in Emergency

In locations where plant failures or accidents could cause conditions of danger due to harmful chemical or physical agents, personal protective equipment capable of protecting persons against such conditions shall be supplied for the use of employees engaged in repair, fire fighting, or rescue operations.

SECTION 12

HEALTH, MEDICAL AND FIRST-AID SERVICES

Head officers shall ensure that medical, health and first-aid services are provided in their departments or instrumentalities in accordance with the requirements and recommendations of the Director-General of Health.

SECTION 13

ACCIDENT RECORDS, STATISTICS AND INVESTIGATION

13.1

Head officers shall arrange for the prompt investigation of all accidents, the determination of causes and contributory factors and the implementation of corrective action.

13.2 Records of Accidents and Injuries

Records of accidents and injuries shall be kept and periodic returns made in accordance with the requirements of the Department of Labor and Immigration.

APPENDIX 9(a)

COMMONWEALTH OCCUPATIONAL SAFETY AND HEALTH—CODES OF PRACTICE—RELEVANT TO OCCUPATIONAL HEALTH

101 Policy and Programs
201 Workplaces
202 Ventilation and Thermal Control
206 Offices
209 Confined Spaces
210 Fire Safety
227 Laboratories (Photographic)
305 Personal Facilities
401 Materials Storage, Stacking and Handling
603 Refrigeration
701 Foundries
702 Abrasive Blasting
703 Electroplating
704 Spray Painting
705 Welding and Cutting
707 Diecasting
740 Forestry
902 Construction (Demolition)

APPENDIX 9 (b)

OCCUPATIONAL HEALTH GUIDES GAZETTED FOR OBSERVANCE IN COMMONWEALTH EMPLOYMENT

Title	*Approved by NH and MRC*	*Gazetted*
Arsenic	90th Session, October 1980	23 December 1980
Arsine	90th Session, October 1980	23 December 1980
Asbestos	84th Session, November 1977	10 October 1978
Benzene	84th Session, November 1977	10 October 1978
Electroplating	85th Session, June 1978	10 October 1978
Fibrous Glass	88th Session, October 1979	8 January 1980
Hydrogen Fluoride (Hydrofluoric Acid)	86th Session, October 1978	9 January 1979
Industrial Organic Solvents	88th Session, October 1979	8 January 1980
Isocyanates	84th Session, November 1977	10 October 1978
Lead (Organic)	90th Session, October 1980	23 December 1980
Occupational Diseases of the Skin	90th Session, October 1980	23 December 1980
Prevention and Control of Occupational Hazards Due to Atmospheric Contaminants	88th Session, October 1979	8 January 1980
Silica (Silicosis)	86th Session, October 1978	9 January 1979
Solvent Degreasing	86th Session, October 1978	9 January 1979
Threshold Limit Values (replaces Hygienic Standards for Atmospheric Contaminants)	90th Session, October 1980	23 December 1980
Welding (Fumes and Gases)	88th Session, October 1979	8 January 1980
Zoonoses	91st Session, June 1981	

Specified industrial diseases*

Disease	*Process or industry*	*NSW*	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*ACT*	*NT*	*CCGE*	*SCA*
Ankylostomiasis (hookworm)	Mining	—	—	—	•	—	—	—	—	•	—
Anthrax	Handling, etc. of										
	(a) animals infected with anthrax	•	•	—	•	—	•*	—	•	•	—
	(b) hides, skins, wool, hair, carcases and bristles	•	•	—	•	•	•*	—	•	•	—
	(c) loading or unloading or transport of merchandise	•	•	—	—	•	—	—	•	—	—
Antimony poisoning	Exposure to it	—	—	—	•	—	—	—	—	•	—
Arsenic poisoning	Use of arsenic	•	•	—	•	•	•*	—	•	•	—
Asbestosis	Exposure to inhalation of asbestos fibres	—	•	—	•	•(*b*)	—	—	—	—	—
Asthma or asthmatic attacks	Working in contact with or the inhalation of the dust of red pine, western cedar, blackwood or of flour or flour dust	—	—	—	•	—	—	—	—	—	—
Avascular necrosis and its sequelae	Any occupation involving working underground or under water where the worker is subjected to greater than normal atmospheric pressure and subsequent decompression	—	•	—	—	—	—	—	—	—	—
Benzene poisoning—including poisoning by its nitro- and amido-derivatives, or homologues	Production, liberation, utilisation of or exposure to benzene, its nitro- and amido-derivatives, or homologues	•	•	—	•	•	•*	—	•	•	—
Beryllium poisoning	Exposure to it	—	—	—	—	—	—	—	—	•	—
Brucellosis (undulant fever)	Work in connection with animals infected with the brucella organism	•(*a*)	•	—	—	—	•*	—	—	—	—
Bursitis (see also cellulitis)—miner's beat elbow	Mining	—	•	—	—	—	•*	—	—	—	—
Cadmium poisoning	Exposure to it	—	—	—	—	—	—	—	—	•	—
Carbon bisulphide poisoning	Contact with or inhalation of carbon bisulphide gas	—	•	—	—	•	•*	—	—	•	—
Carbon dioxide poisoning	—	—	—	—	—	—	•*	—	—	—	—
Carbon monoxide poisoning	Contact with or inhalation of carbon monoxide gas	—	•	—	•	•	•*	—	—	•	—

Source: *Workers compensation Legislation in Australia* 1980, Department of Social Security, AGPS, Canberra, 1981.

Disease	*Process or industry*	*NSW*	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*ACT*	*NT*	*CCGE*	*SCA*
Cellulitis—subcutaneous, or acute bursitis arising on or about knee (beat knee)—subcutaneous hand (beat hand)	Mining	—	•	—	—	—	•*	—	—	—	—
Chrome ulceration	Use of chromic acid or bichromate of ammonium potassium or sodium	—	•	—	•	•	•*	—	—	•	—
Communicable disease	Exposure to infection by the intermediate hosts of any communicable disease, where within a reasonable period of incubation, specific infection has followed demonstrable action of the particular vectors or agents concerned in the transmission of the disease, or where that action can be reasonably presumed	—	—	—	—	•	—	—	—	—	—
Compressed air illness	Carried on in compressed air	—	—	—	—	•	•*	—	—	—	—
Copper poisoning	Use of copper	—	•	—	•	—	—	—	—	•	—
Cyanogen compounds poisoning	Use of them	—	—	—	—	•	•*	—	—	—	—
Deafness (see noise-induced hearing loss)											
Dermatitis	Exposure to or contact with the dust of blackwood, sulphuric acid, flour or flour dust	—	—	—	•	—	—	—	—	—	—
Dermatitis venenata	Use of vegetable or mineral matter	—	•	—	—	—	—	—	—	—	—
Dermatosis to skin or ulceration or injury to skin or mucous membranes of mouth or nose wholly or partly produced or aggravated by contact with or inhalation or ingestion of irritating gases or fumes or mineral or vegetable irritants or ray burn	Any industrial process	—	—	—	—	•	•*	—	—	—	—
Depuytren's contracture		—	—	—	—	—	•*	—	—	—	—

Disease	*Process or industry*	*NSW*	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*ACT*	*NT*	*CCGE*	*SCA*
Electrical currents, effects of	Exposure to electrical currents	—	—	—	—	•	—	—	—	—	—
Epitheliomatous cancer (primary) of the skin	Handling of mineral oils, pitch, tar, etc.	•	•	—	—	•	•*	—	•	•	—
Epithelioma, scrotal (chimney sweep's cancer)	Chimney sweeping	—	—	—	—	•	—	—	—	—	—
Fluorine poisoning	Use of fluorine	—	—	—	—	•	—	—	—	—	—
Halogen derivatives of hydrocarbons of the aliphatic series, poisoning by	Production, liberation or utilisation of them	•	•	—	•	•	—	—	•	•	—
Hydatids	The handling of dogs	—	—	—	—	—	•	—	—	—	—
Hydrogen cyanide, poisoning by	Exposure to it	—	—	—	—	—	—	—	—	•	—
Hydrogen sulphide, poisoning by	Exposure to it	—	—	—	—	—	•*	—	—	•	—
Inflamation of the synovial lining of the wrist joint and tendon sheaths	See tenosynovitis										
Insolation, effects of	Prolonged exposure to sunlight	—	—	—	—	•	—	—	—	—	—
Lead poisoning	Use of lead	•	•	—	•	•	•*	—	•	•	—
Leptospirosis, endemic typhus, scrub typhus, brills disease, swineherd's disease, plague, mite, dermatitis and scrub itch	Exposure to infection with a specific disease transmissable from animal to man where the specific infection associated with the occupation or situation develops within its known incubation period and can be reasonably presumed to have occurred in the course of such employment	•(*a*)	—	—	—	•	—	—	—	—	—
Manganese poisoning	Exposure to it	—	—	—	—	—	—	—	—	•	—
Mercury poisoning	Use of mercury	•	•	—	•	•	•*	—	•	•	—
Mesothelioma—primary malignant neoplasm of the mesothelium (diffuse mesothelioma) of the pleura or of the peritoneum	Substantial exposure to blue asbestos (Crocidolite) dust	—	—	—	—	•	—	—	—	—	—
Mineral poisoning, other than by arsenic, phosphorous, lead or mercury	Use of minerals other than arsenic, phosphorus, lead or mercury	—	—	—	—	•	•*	—	—	—	—
Nitrous fumes poisoning	Working in contact with nitric acid or inhalation of nitrous fumes	—	—	—	•	•	•*	—	—	•	—

Disease	*Process or industry*	*NSW*	*Vic.*	*Qld*	*SA*	*WA*	*Tas.*	*ACT*	*NT*	*CCGE*	*SCA*
Noise-induced hearing loss	Exposure to noise	—	—	—	•	•	•*	—	—	—	—
Nystagmus	—	—	—	—	—	—	•*	—	—	—	—
Oxide of nitrogen, poisoning by	See Nitrous fumes poisoning										
Phosphorus poisoning	Use of phosphorus	•	•	—	•	•	•*	—	•	•	—
Pneumoconiosis	Exposure to mineral dusts harmful to lungs	—	—	—	—	•	—	—	—	•	—
Pneumonoconiosis	—	—	—	—	—	—	•*	—	—	—	—
Pulmonary emphysema, chronic	—	—	—	—	—	—	•*	—	—	—	—
'Q' fever	Exposure to coxiella burnetii	•(*a*)	—	—	—	—	—	—	—	•	—
Radium and other radioactive substances or x-rays, pathological manifestations due to	Exposure to their action	•	•	—	•	•	•*	—	•	•	—
Septic poisoning	Handling of meat or the manufacture of meat products or animal by-products in connection with the trade of a butcher or slaughterman	—	•	—	•	—	—	—	—	—	—
Silicosis (with or without tuberculosis)	Exposure to inhalation of silica dust	—	•	(*b*) •(*c*)	•	•(*b*)	—	—	•(*b*)	—	—
Anthraco-silicosis	Exposure to inhalation of silica dust	—	—	(*b*) •(*c*)	—	—	—	—	—	—	—
Telegraphist's cramp	—	—	—	—	—	—	•*	—	—	—	—
Tenosynovitis (inflammation of tendon sheaths of hands, wrists, forearm or elbow)	Preparation, preserving, canning or bottling of jams, sauces, fruit, pickles, etc. for human consumption	—	•	—	—	—	•*	—	—	—	—
Toxic gas poisoning, other than those listed	—	—	—	—	—	—	•*	—	—	—	—
Undulant-fever—see Brucellosis	—										
Vanadium poisoning	Exposure to it	—	—	—	—	—	—	—	—	•	—
Vibration, effects of (including Raynaud's phenomenon and dead hand)	Use of vibratory tools, implements and appliances	—	—	—	—	•	—	—	—	—	—
Zinc poisoning	Use of zinc	—	•	—	•	—	—	—	—	•	—

* In Tasmania no process or industry specified.
(*a*) In NSW slaughtering or handling of cattle or cattle by-products in or about an abattoir or slaughter-house.
(*b*) Employer not given opportunity to prove no link between employment and disease.
(*c*) Special rates of compensation.

APPENDIX 11

RECOMMENDATIONS OF MYERS COMMITTEE ON OCCUPATIONAL SAFETY AND HEALTH AND THE GOVERNMENT'S RESPONSES*

Myers Report Recommendation 9

The Committee recommends that a Bureau of the Working Environment be established within the Department of Productivity from elements of the Working Environment Division and with direct responsibility to the Minister for Productivity.

The aim of the Bureau should be to assist in the improvement of the quality of working life for all Australians. The work program of the Bureau should be established by an appropriately constituted Council of Advice, which would include employer and union representatives. The Bureau should be headed by a recognised expert, perhaps on secondment and should keep abreast of overseas developments, undertake and commission research, including research on safety at work, disseminate its findings as widely as possible monitor standards and practices and make recommendations for change where appropriate.

Response

Accepted in principle. Additional emphasis to be given in the Working Environment field to research, information provision and the co-ordination of uniform standards and Codes of Practice; such emphasis can be accommodated within the present structure of the Department of Productivity. The proposed Council of Advice is accepted.

Myers Report Recommendation 10

The Committee recommends that the Commonwealth actively promote the establishment of a National Consultative Committee on Occupational Safety and Health to foster the adoption of improved and uniform regulations throughout Australia.

Response

Accepted.

Myers Report Recommendation 11

The Committee recommends that the Commonwealth Minister for Health ask the National Health and Medical Research Council to examine ways and means that would enable more research of direct relevance to Australian conditions to be done in the field of occupational health.

Response

Accepted. The Government will also be examining the availability of vocational training in occupational health.

Myers Report Recommendation 12

The Committee recommends that the proposed bureau of the Working Environment prepare as a matter of priority a consolidation of the Code of General Principles on Occupational Safety and Health in Commonwealth Government Employment and the supporting codes of practice approved to date and that the consolidated document be widely disseminated.

Response

Accepted-within existing Departmental structure.

* Myers Report. Report of the Committee of Inquiry into Technological Change in Australia, AGPS, Canberra, 1980. Government responses taken from *Hansard*, House of Representatives, 18 September 1980, p. 1522–3.