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INTRODUCTION

Organisation of the document

The Draft Practical Guides on Human Health and Chemical Accidents are set out in Chapters 1-4 of this document. Issues in the following areas relating to health aspects of chemical accident prevention, preparedness and response are addressed:

- **health sector information and communications needs;**
- **the organisation and planning of health sector response to chemical accidents;**
- **the role of the health sector in responding to chemical accidents;** and
- **training and education for chemical accident prevention, preparedness and response.**

Annex I provides a brief overview of current chemical hazard identification systems.

Annex II is a selected list of bibliographical references.

These Practical Guides are intended for the use of members of the health care professions who may be called upon to assist the victims of chemical accidents. They are also addressed to those at the operational level in, for example, public authorities (at the national, regional or local level), hospitals and other treatment facilities, civil defence and rescue services, Poisons Information Centres, chemical response centres, and industry with responsibilities for preparing and implementing chemical accident contingency plans.

It is recognised that the responsibilities of the various parties involved in chemical accident prevention, preparedness and response vary from country to country and even within countries, as do health sector interfaces, emergency response procedures and accident follow-up.

International co-operation in the preparation of the Practical Guides

Four international organisations worked together to organise the preparation of these Practical Guides:

- the International Programme on Chemical Safety (IPCS);
- the United Nations Environment Programme Industry and Environment Programme Activity Centre (UNEP-IE/PAC);
- the World Health Organization-European Centre for Environment and Health (WHO-ECEH); and
- the Organisation for Economic Co-operation and Development (OECD).

The four collaborating organisations brought together medical and other types of experts involved in chemical accident prevention, preparedness and response in Africa, Asia (including the Middle East), Europe, and North and South America. These experts helped develop an international perspective on the issues addressed in the Practical Guides.

Following their review at the 13th-16th April 1993 Utrecht Workshop on Health Aspects of Chemical Accidents, organised by the four collaborating organisations, the Practical Guides will be used by these organisations in their respective activities to improve chemical accident prevention, preparedness and response.

These Guides will be used by IPCS in promoting effective international co-operation with respect to chemical accidents, and in strengthening national medical capabilities for the prevention and treatment of the harmful health effects of chemical accidents. They will also be used to provide technical input to the WHO Programme on Emergency Preparedness Planning, which addresses the health aspects of major disasters, and in the development of training material for use by WHO Regional Offices in their chemical safety activities. In particular, the WHO-European Centre for Environment and Health will make use of the Practical Guides in technical co-operation with its member countries.

The Guides will also be used by UNEP in the Awareness and Preparedness for Emergencies at Local Level (APELL) process, and by OECD in expanding its *Guiding Principles for Chemical Accident Prevention, Preparedness and Response.*

Definition and classification of "chemical accident"

Definition

For the purposes of this document, the terms "chemical accident" and "chemical emergency" are used to refer to an event or dangerous occurrence resulting in the release of a substance or substances hazardous to human health and/or the environment. Such events or occurrences include fires, explosions, leakages or releases of toxic substances that can cause illness, injury, disability or death to (often a large number of) human beings.

While dispersed populations may be affected through contamination of water and the food chain resulting from a chemical accident, the exposed population is frequently either inside or immediately outside an industrial site. In an urban area, the exposed population may be in the vicinity of a ruptured vehicle that has been transporting hazardous substances. Less frequently, the exposed population is at some distance from the accident site, including possibly in areas across national borders. Potentially affected areas in neighbouring countries could include those with limited chemical emergency response plans or capabilities.

This definition needs to be set alongside the concept of a "chemical incident", in which an exposure arising from releases of a substance or substances may result in illness or the possibility of illness. The number of people affected by a chemical incident may be very few (two or more), and illness, disability or death may occur a considerable time (for example, several years) after the exposure.

In addition to human health effects, chemical accidents may result in extensive or long-term damage to the environment, with considerable human and economic costs.

Classification

From the health perspective, there are a number of ways of classifying chemical accidents, none of which is complete or mutually exclusive. Classification may, for example, be based on: the chemicals involved; the sources of release; the extent of the contaminated area; the number of people exposed or at risk; the routes of exposure; and the health or medical consequences. Each of these ways of classifying chemical accidents is elaborated below.

a) Chemicals involved

The chemicals involved in an accident may be grouped according to whether they are:

- dangerous substances (for example, explosives, flammable liquids or solids, oxidizing agents, toxic substances and corrosives);
- additives, contaminants and adulterants (in, for example, drinking water, food and beverages, medicines and consumer goods); or
- radioactive products (not dealt with in these Practical Guides).

b) Sources of the release

Releases may result from human activity or be of natural origin:

- *Anthropogenic* sources include manufacture, storage, transport (rail, road, water and pipeline), use and disposal.
- Sources of *natural origin* include volcanic and other geological activity, toxins of animal, plant and microbial origin, natural fires and minerals.

c) Extent of the contaminated area

Accidents may be classified according to whether they:

- were contained within an installation and affected no one outside;
- affected only the immediate vicinity of an installation;
- affected a wide area around an installation; or
- were highly dispersed.

d) Number of people exposed or at risk

Chemical accidents could be classified as affecting:

- several persons only (fewer than ten);

- a number of persons (ten to 100);
- many persons (100-1000); or
- very many persons (over 1000).

The number of people affected could be calculated as deaths, injuries, and/or evacuees. However, the severity of an accident will be determined by its circumstances and consequences. Severity cannot be determined solely on the basis of the number of people affected.

e) Routes of exposure

There are four main routes of exposure:

- eye exposure (see Sections 3.2.1 and 3.3.3.1);
- skin contact (Sections 3.2.2 and 3.3.3.2);
- inhalation (Sections 3.2.3 and 3.3.3.3); and
- ingestion (3.2.4 and 3.3.3.4)

From the health perspective, routes of exposure could be a means of classifying chemical accidents. However, none of these routes of exposure is mutually exclusive.

f) Health or medical consequences

Chemical accidents could also be classified according to the health or medical consequences, or according to the system/organ affected. Examples would be accidents giving rise to carcinogenic, dermatological, immunological, hepatic, neurological, pulmonary or teratogenic effects.

Special features of chemical accidents

In principle, the organisational structure that exists to respond to other types of accidents (for example, natural disasters) can be used in the event of a chemical accident. From the health perspective, however, chemical accidents have several special features. These are outlined below:

- All the victims of a "pure" chemical accident will suffer the same types of harmful effects. Only the magnitude of harm will be different.
- There may be a toxic zone that can only be entered by personnel wearing full protective clothing. Ambulance and other medical personnel should never enter such a zone.
- Victims exposed to chemicals may constitute a risk for rescue personnel, who could become contaminated by the chemicals left on the victims. Therefore, early decontamination should preferably take place before victims are given proper care.

- Hospitals (and other treatment facilities) and the roads leading to them may be located in the toxic zone, so that access is blocked and new patients cannot be received for a considerable period of time. Plans should therefore be drawn up for temporary treatment facilities in schools, sports centres, tents, private homes, etc.

- For many chemicals, general knowledge of their properties and effects may not be complete. Effective systems should therefore be identified for obtaining essential information on the chemical(s) of concern and providing this information to rescue workers and other persons who need it.

- Inventory activities need to be carried out to identify risks (fixed and mobile) and to identify resources available for taking care of victims who suffer corrosive and thermal burns and those in need of ventilatory support.

- A number of victims may need to be kept under observation for one or two days even though they do not have symptoms.

1. HEALTH SECTOR INFORMATION AND COMMUNICATIONS NEEDS

1.1 Introduction

Information is a critical element of chemical accident prevention, preparedness and response. The health sector's information and communications needs, sources of information, and communications links will be considered in general terms in this chapter.

Well in advance of any chemical accident that might occur, information and communications needs should be examined. Plans should then be carefully drawn up for meeting these needs. Procedures for obtaining and disseminating information should be tested. These activities should not be left until an accident has occurred.

1.1.1 Parties who need information

The nature of the information needed differs according to whether it is addressed to, for example, first responders, medical staff and other health care professionals, or the general public. In the case of health care professionals, the type of information they need depends on their position in the "treatment chain" (see Section 1.2). All information provided should be clear, concise and readily understandable by those to whom it is addressed.

Parties who need information include the following:

- *Those involved in organising and planning health-related aspects of chemical emergency response* should have access to information on the nature and amounts of chemicals present at installations. To ensure that adequate response capability is available (including trained personnel, medical supplies and equipment), they also need information on the types of chemical accidents that could occur and the population that would potentially be affected. (Also see Section 2.2.4.)

- *First responders* need to be able to obtain information rapidly at the scene of the accident, including information on the chemical(s) involved, the population at risk, how to care for accident victims, and the location of hospitals and other treatment facilities.

- *The health sector at all levels*, in order to provide adequate care for victims exposed to chemicals, needs information on the chemical(s) involved, including hazards, acute and possible delayed health effects, first aid measures, and when decontamination procedures are indicated, as well as more detailed treatment information including possible specific therapy such as giving antidotes.

- *The potentially affected public* should receive information on how to behave in the event of a chemical accident so as to minimise health risks. The public should also be provided with information during the emergency situation so they can take appropriate action.

(Also see Chapter 4: "Training and Education for Chemical Accident Prevention, Preparedness and Response".)

1.1.2 Information provision and dissemination

For effective information provision and dissemination, formal chains of communication need to be created. Links should be established among all the appropriate parties, taking account of the need to be able to respond to a wide range of possible chemical accident scenarios.

The availability of information, and the conditions for disseminating it, will vary according to the location, type, and other characteristics of the accident. Emergency preparedness planning should take account of the fact that normal means of communication may not function adequately in emergency situations (for example, telephone lines may be damaged or insufficient).

The evaluation of the chemical accident, and of information and communications needs, should begin as soon as first responders arrive at the accident site. Often the first to arrive will be the police or fire services. Pre-hospital health care professionals may also quickly become active.

Information on the nature and extent of the accident, and appropriate response measures, should be continuously updated -- beginning with the information supplied by the caller who reports the accident, which may not be wholly accurate or complete.

During emergency preparedness planning, it should be recognised that information (for example, medical, chemical or other technical information) will need to be provided as rapidly as possible, preferably by experts. Experts may need to question those seeking information in order to establish the level of information required.

No prepared information source can take the place of experts, where they are available. Some technical judgement will invariably be required, for example to take account of the quantity of the chemical(s) involved, the accident location, and variations in health effects and their observed features.

Information on chemicals is increasingly widely available. Care should nevertheless be taken in selecting appropriate information for a specific purpose. Information obtained from general sources often needs to be interpreted by an expert before it can be applied to a particular situation. Information in textbooks may be out of date.

In each country, one or more specialised information centres (see Section 1.3) should exist for the purpose of organising the collection, collation and dissemination of information needed for chemical accident prevention, preparation and response. In a large country, it may be appropriate to have a network of centres suitably linked.

Information provided at the time of the accident should not be restricted to physical, chemical and toxicological properties of the chemical(s) involved, but should extend to practical advice on how to respond to, for example, spills and fires. This information should also cover basic first aid and identify local sources of expertise, as well as appropriate treatment facilities.

Information obtained at the accident site, including symptoms of the victims, exposure time, etc., should be given to the information provider (when appropriate). In this way, the information provider will be able to compare what is happening with what would be expected to happen (see Section 1.2.3).

1.2 Types of information needed by the health sector

1.2.1 Before a chemical accident occurs

Various types of information are needed for awareness and for emergency preparedness planning (see, *inter alia*, Section 2.2, Section 2.3.5, and Chapter 4).

1.2.2 At the chemical accident site

To take care of victims, *first responders* at the accident site need to know immediately the chemical(s) involved, associated hazards, and first aid measures. Such basic information is generally found on safety data sheets or transport emergency cards (see Annex I), which may also state whether a specific treatment is possible (for example, with antidotes). Data sheets or cards are normally available where chemicals are manufactured or transported. Vehicles that transport dangerous goods carry transport emergency cards. Rescue services (police and fire services, etc.) often have data sheets or cards in their vehicles.

In the case of minor chemical incidents, and where trained health care professionals are available (for example, nurses), the information on data sheets or cards may be sufficient. However, if the incident is more extensive, more detailed information may be required on the chemical(s) and their health and environmental effects. Rapid communications will then need to be established with a specialised information centre such as a Poisons Information Centre or chemical response centre (see Section 1.3).

In many parts of the world, safety data sheets or transport emergency cards are not always available. In the event of a chemical accident, those responding to it must therefore locate other sources of information. These sources may include a Poisons Information Centre, chemical response centre, or even a local chemist, pharmacist or health worker.

Health care professionals at the site of a chemical accident, such as ambulance personnel, paramedics and medical teams (doctors and nurses), will need more detailed information on symptoms, signs and therapeutic measures, especially in situations where specific therapy (for example, with antidotes) is to be given at the accident site. This type of information can be provided by a specialised information centre.

For a number of chemicals, where specific therapy is possible or where the chemical is known to be handled, stored or transported in large quantities, specific treatment instructions should be available at local hospitals and other treatment facilities. It should be possible to bring these instructions to the accident site, if necessary. Examples are given in **Table 1.1** of chemicals for which treatment instructions should be readily available.

Specific treatment instructions should be compiled, distributed and updated regularly by national or regional Poisons Information Centres.

Health care professionals will also need information concerning hospitals and other treatment facilities created on an emergency basis for admittance of patients and provision of supportive or other special care. Doctors, for example, need to know the number of beds available at emergency units or intensive care centres, as well as the availability of respirators or other specialised equipment, antidotes, and other necessary pharmaceuticals.

Table 1.1 Examples of chemicals for which specific treatment instructions should be readily available in the event of exposure

Acetonitrile

Acids

Alkali

Ammonia

Arsenic

Carbon monoxide

Chlorine

Combustion products

Cyanide, hydrogen cyanide

Formaldehyde

Hydrofluoric acid

Hydrogen sulphide

Irritant gases

Liquified petroleum gas, LPG

Mercury

Nitrites

Nitrobenzene

Nitrogen gases

Organophosphates

Petrol

Phenol

Phosgene

Phosphorus (yellow, white)

Sulphur dioxide

Vinyl chloride

1.2.3 At hospital level

At hospital level, more detailed information is needed on hazards, symptoms, treatment and follow-up of victims and of the potentially exposed population. Not only do the immediate health effects of the chemical need to be known in detail, but also the secondary and chronic effects and potential sequelae. The medical and other professional staff or advisers at specialised information centres should be able to provide the medico-toxicological information needed by the treating physicians.

1.2.4 At specialised information centres

Centres that specialise in providing information on chemicals, such as Poisons Information Centres and chemical response centres (see Section 1.3), should be able to provide complete information on the chemical(s) involved in the accident and their health and environmental effects. However, it should be stressed that these specialised centres also need to receive information on the accident and on observed effects. It is of the utmost importance to establish dialogue and exchange of information between emergency responders and the professionals at an information centre. Victims' symptoms, the degree of exposure, time elapsed, number of people affected, and many other types of information are needed, not only to assess the chemical emergency but also to predict what would be expected to happen.

The information centre also needs to know how health sector response to the accident is being co-ordinated, so that it can provide any advice needed in regard to the transport and admittance of patients. This is especially important when a large number of victims must be transported to various medical (or forensic medical) units.

1.3 Obtaining information from specialised information centres

Additional information will invariably be needed to supplement that already available at the accident site from on-site sources such as safety data sheets and transport emergency cards (see Annex I), or as a result of emergency preparedness planning. It may be possible to obtain this information from specialised information centres such as Poisons Information Centres and chemical response centres.

1.3.1 General procedures

Specialised information centres should be accessible 24 hours a day, every day of the year, so that they can respond in the case of a chemical accident.

Enquiries relating to health effects may be received from:

- first responders, including police and fire services, who need to know, for example, the first aid measures that may be required before health care professionals arrive as well as the precautionary measures to take in order to avoid being contaminated while responding to the chemical emergency (or while taking part in the decontamination of the site later);
- health care professionals who go to the site of the accident, or who transport or care for victims;
- the public affected by (or located in the vicinity of) the accident, who may need reassurance as well as practical advice;

- the media (radio, television, press, etc.), whose job is to keep the public informed about the accident; and

- public authorities responsible for health and environmental protection, who need to know the possible immediate, medium- and long-term consequences of the accident.

The information provided should be direct, concise and accurate. It should not be speculative or inflammatory. For each enquiry, the information centre should adapt its information and advice to specific circumstances, including the nature of the accident and the condition of victims. The centre should also take into consideration the type of enquiry, the level of technical understanding of the enquirer, and the purpose for which the information will be used.

The information centre should be able to provide the following types of information:

- information on the chemicals involved in the accident:

  - physico-chemical properties;

  - toxicological properties;

  - clinical effects of the chemical, including delayed and long-term effects;

  - possible transformation or degradation products of the chemical, for example in contact with water, by pyrolysis, etc.

- information on medical treatment addressed to the lay (not medically qualified) person, the general practitioner, and the medical expert in a specialised area such as intensive care;

  - signs and symptoms expected following different types of exposure such as inhalation, skin absorption and ingestion;

  - advice on how to decontaminate the patient;

  - medical treatment, including use of antidotes, depending on the circumstances, severity of the victims' condition, and availability of hospital or intensive care facilities;

  - advice on how to make a triage of cases, particularly when many victims are involved, taking into consideration the number of victims, the local circumstances, and the availability of antidotes, supportive health care facilities or special equipment;

  - advice on the collection and storage of samples for toxicity and other analyses;

  - advice on protective measures that can be taken by the medical and emergency response personnel so as to avoid becoming contaminated themselves;

  - the location of antidotes and other drugs;

  - the location of laboratories and the types of analyses they are able to do.

Where a co-ordinating centre (for example, an emergency control centre) does not exist, the information centre may also need to provide the following types of information:

- information on medical facilities available to respond to the emergency:
    - the locations of, for example, health care centres and dispensaries, rural or local hospitals, and main central hospitals, together with the types of facilities they have available, the number of beds, and the availability of supportive care measures, mechanical ventilators, oxygen supply, and special equipment;
    - means of transporting victims (ambulances, helicopters, etc.).
- information on how to contact essential services:
    - whom to contact in local authorities, and at what times;
    - how to contact police, fire and other rescue services;
    - who has the local co-ordinating role in an emergency.

In order to perform their job of providing relevant information, these centres must not only have toxicological and clinical data on the chemicals in normal daily use, and on natural toxins, but also on less frequently used industrial chemicals including reactive intermediates. They need to collect information on all chemicals likely to be involved in accidents in their area, region or country. To this end, they need to collect or have rapid access to information on:

- the types and quantities of chemicals being processed, used, stored and transported,
- hazardous points, processes and activities;
- chemicals that might be released from industrial and commercial installations, including in what forms and quantities;
- possible protective and remedial measures being taken or available locally;
- lists of experts from industry, public authorities, etc. on particular chemicals or groups of chemicals (to be updated by industry: see Section 1.4.2).

An information centre also needs to evaluate the populations and circumstances at high risk for a chemical accident. To do so, they need to know:

- the locations of major concentrations of chemicals;
- the number of workers at particular installations;
- the number of inhabitants in an area or region;
- details on water supply, in the event of contamination.

There may be a need to establish voluntary arrangements with local industry in order to obtain the required information (see 1.4.2). In some cases, there is a legal requirement that public authorities must be notified of high-risk activities involving chemicals. Relevant information should be made available to the information centre. The information centre should also be informed when dangerous cargoes are transported or high-risk activities involving chemicals are undertaken.

Information on (or people who have had) experience with previous accidents involving industrial chemicals may be available at many installations, but will not always available outside them. It is of the greatest importance for information centres to have access to such information.

In the event of a major chemical emergency, information centres should provide relevant information to those dealing directly with the emergency, as well as to public authorities and all other relevant parties, to ensure rapid and effective response. The media should receive appropriate information for transmission to the general public (see Section 2.3.5).

An overflow of telephone calls is to be expected in the event of a chemical emergency. The information centre should be prepared for such a situation, discouraging panic and disseminating advice as rapidly as possible.

Amateur radio operators can be very effective in transmitting information within the community and at greater distances.

Activities should be undertaken to ensure the exchange of information and experience among different health services and information centres. It is particularly important for different types of national information centres that perform complementary roles in collecting and disseminating information of use in chemical accident prevention, preparation and response to establish and maintain good communications links. For example, basic information such as chemical identification, hazards and toxicity is needed by both Poisons Information Centres and chemical response centres. Unnecessary duplication of data and associated costs can be avoided if communications links are established at an early stage.

1.3.2 Poisons Information Centres (PICs)

In many countries, information needed for health sector response is provided by Poisons Information Centres (PICs), which may exist at local, regional/state and national levels.[1]

A Poisons Information Centre may act as the local focal point for response to a chemical accident. It should therefore be prepared to provide adequate information rapidly in an acute situation. In the process of building up a toxicological data bank, the Poisons Information Centre should collect information on all chemicals likely to be involved in accidents in its area, region or country, including the less frequently used industrial chemicals, reactive intermediates and related matters.

Various inventory activities must precede this activity. Poisons Information Centres should request or collect information on:

- the chemicals and their effects;
- high-risk points, processes and/or activities;
- which chemicals might be released, and in what forms and quantities; and
- possible protective and remedial measures.

[1] The functions of a Poisons Information Centre are described in *Guidelines for Poisons Control* (World Health Organization, 1993).

Poisons Information Centres need to know the exact location, capabilities and capacities of toxicological analytical services, as well as emergency transport facilities. They also need information on the responsibilities and roles of public authorities and other partners in chemical accident response. They should establish close communications links with police and other rescue services.

The types of information outlined above should be gathered by the Poisons Information Centre itself when emergency preparedness planning has not yet been adequately organized, or requested from public authorities when such planning exists and is effective. There is often a legal requirement that public authorities be notified of high-risk activities involving the use of chemicals, along with their location and storage. Consequently, appropriate information in this respect can also be made available to Poisons Information Centres.

In some countries, Poisons Information Centres previously identified as local focal points for chemical emergencies are informed when dangerous cargoes are to be transported or high-risk activities involving chemicals undertaken.

Poisons Information Centres share medical information and experience internationally through various professional bodies, such as the World Federation of Associations of Clinical Toxicology Centres and Poison Control Centres and its member national and regional associations, as well as through the activities of the International Programme on Chemical Safety (IPCS).

1.3.3 Chemical response centres

Ideally, each country should have a National Chemical Response Centre specifically designed to provide assistance in the event of a chemical accident. It should operate on a 24-hour basis, every day of the year. Such a response centre may be set up by major chemical producers, hospitals or governments. It may be an independent entity, or be established in combination with a Poisons Information Centre. It should in any case maintain a close liaison with a Poisons Information Centre to ensure that necessary medical advice can be provided.

In addition to Poisons Information Centres, which provide information related to health effects of chemical emergencies, the establishment of chemical response centres has been seen as a key requirement for adequate response in many countries that have either high production capacities for chemical products or large volumes of chemicals in transit. For example, in the United States there is a Chemical Transportation Emergency Center (CHEMTREC), established by the Chemical Manufacturers Association in Washington, D.C.; in the United Kingdom there is a National Chemical Emergency Centre at Harwell; in Germany there is a National Response Centre at BASF Ludswigshafen; and in Argentina there is a National Chemical Response Centre in Buenos Aires.

In some countries, an existing Poisons Information Centre acts as a chemical response centre. In other countries, such as Algeria and Uruguay, the national Poisons Information Centre acts as the National Chemical Response Centre.

Chemical response centres can be mutually supportive, sharing information and experience in order to improve their response capabilities. With increased international transport of chemicals, there is an even greater need for these centres to establish communications links with each other. This was a basis for the initiative recently undertaken by the European Petrochemical Association (EPCA), together with the European Chemical Industry Council (CEFIC), in establishing the ICE (International Chemical Environment) project. One of the main elements of ICE is to assist in establishing international links

between existing centres and to encourage countries that do not currently have a National Response Centre to develop one.

The communications links established by ICE have proved particularly valuable in Europe when, for example, chemical transport accidents involving an imported chemical product occur. Those responding to the accident can obtain information through their National Response Centre, which can communicate in turn with a response centre in the exporting country.[2]

It has been agreed that English will be used for international communications between such response centres. In some cases, language problems might be largely overcome by using numeric codes and by adopting standardised expressions.

1.4 Other sources of information

1.4.1 Chemical databases and computerised information systems

A number of databases and computerised information systems provide information on chemicals, including health effects.[3] This information may be available on paper, via interactive on-line access, or on disk (including CD-ROM). In an acute situation, first responders and health care professionals normally do not have time to use such systems. Moreover, in general these personnel are not trained to search different sources and evaluate the information obtained. The professional information providers at Poisons Information Centres and chemical response centres, on the other hand, are used to accessing information in this way and, when necessary, evaluating it.

Such databases and information systems should only be used by those with proper training. Once evaluated, information can be disseminated to the appropriate parties.

1.4.2 Industry

In general, industry has the principal responsibility for providing reliable background information on the chemical(s) it stores, handles, reprocesses, manufactures and distributes, or that are used in the workplace. The highest level of information on a specific chemical product (in terms of both amount and sophistication) is available from product manufacturers.

Industry should ensure that this information is readily available, and that it is provided to public authorities, Poisons Information Centres and chemical response centres, as appropriate. One way this can be done is by making an expert available, i.e. a scientifically qualified employee such as a plant manager. It is important to pick someone to work with chemical emergency planners and responders who not only has technical knowledge but can also work with those who are not scientifically trained.

[2] See also *International Directory of Emergency Response Centres* (OECD/UNEP, 1991).

[3] See, for example, *Users Guide to Hazardous Substance Data Banks Available in OECD Member Countries* and *Users Guide to Information Systems Useful to Emergency Planners and Responders Available in OECD Member Countries* (both OECD, 1991).

Industry should provide specialised information centres with updated lists of experts in industry, public authorities, etc. who can advise on specific chemicals.

1.4.3 International organisations

Several international organisations prepare evaluated data on chemicals for use by member states in developing their own chemical safety measures. Some examples include the following IPCS publications:

- *Environmental Health Criteria documents* are designed for scientific experts responsible for the evaluation of the risks posed by chemicals to human health and the environment. They give a summary of the literature on the physical, chemical and toxicological properties of a chemical, and provide an evaluation of the risks to human health and the environment;

- *Health and Safety Guides* are designed for a wide range of administrators, managers and decision-makers in various ministries and governmental agencies, as well as in commerce, industry and trade unions, who are involved in various aspects of using chemicals safely and avoiding environmental health hazards. They are short documents summarizing toxicity information in non-technical language and providing practical advice on matters such as safe storage, handling and disposal of the chemicals, accident prevention and health protection measures, first aid and medical treatment in cases of exposure leading to acute effects, and clean-up procedures.

- *International Chemical Safety Cards* summarize essential product identity data and health and safety information on chemicals. They are designed to provide evaluated information for use at the shop floor level in factories, agricultural and other workplaces.

- *Poisons Information Monographs (PIMs)* are designed for Poisons Information Centres and others. They give medical advice on prevention and treatment of poisoning, summarize the basic chemical, physical and toxicological properties of the substance, and provide advice on diagnosis and patient management, including analytical toxicological methods.

The IPCS Guidelines for Poisons Control include a list of databases used for medical response to chemical emergencies. In addition, the IPCS is producing a computerized poisons information package, IPCS/INTOX.

The UNEP International Registry of Potentially Toxic Chemicals (IRPTC) provides data profiles on chemicals. A collection of some 80,000 *chemical safety sheets*, as well as information on workplace legislation, are available from the ILO's Occupational Safety and Health Information Centre (CIS).

1.5 Communications links

Good communications are essential in order to implement and co-ordinate effective chemical emergency response (see 2.3.2). Problems with communications may arise from equipment failure (for example, interrupted lines) or from human error related to stress. The main communications links that need to be ensured include: those between specialised information centre(s) and personnel at the accident site; those within and between hospitals and other treatment facilities; and those between the co-ordinating centre (for example, an emergency control centre) and the media.