INTRODUCTORY DOCUMENT

This introductory document first gives some information on the nature of the documentation provided for the IPCS/UNEP/WHO/OECD Workshop on Health Aspects of Chemical Accidents, to be held in Utrecht on 13th-16th April 1993. Next, this document briefly describes the activities, related to chemical accidents, of the four international organisations that have collaborated in organising the Workshop. Finally, the document sets the scene for discussion by presenting a brief overview of chemical accidents, including a list of some of the major chemical accidents that have occurred worldwide (**Table 1**).

1. WORKSHOP DOCUMENTS

Three draft documents have been prepared for consideration at the Workshop. They will provide the basis for discussion at a series of technical sessions. While detailed agreement on the texts is not being sought, the Workshop is expected to reach a general consensus on the content of each of these documents, with a view to their future use.

By agreeing upon the revisions needed to the three draft documents, the Workshop can provide important materials that will be considered to represent an international viewpoint on the topic of health aspects of chemical accident preparedness and response. These documents can then be utilized by the collaborating international organisations, as well as by others, in guidance and training materials.

The Draft General Guidance Document (document no. 1) is meant to provide the basis for preparing policy guidance for decision-makers and managers potentially involved in chemical accident preparedness and response, primarily in the health sector. This would include officials at, for example, Ministries of Health, regional and local health authorities, hospitals, Poisons Information Centres and occupational health centres.

Many other organisations and individuals with responsibilities related to chemical accident preparedness and response will also need to consider the health aspects of such accidents, and will need to work closely with health care professionals. Therefore, this document is also addressed to those in, for example, local authorities, civil defense agencies, rescue services and industry who are involved in emergency preparedness planning.

The Draft Practical Guides (document no. 2) consist of four chapters on specific aspects of the health sector's responsibilities in relation to chemical accident preparedness and response. They cover: the health sector's information and communication needs; the organisation and planning of the health sector's response to chemical accidents; the role of the health sector in responding to chemical accidents; and training and education. The Practical Guides are directed to health care professionals who may be called upon to care for the victims of chemical accidents, and to those at the operational level in, for example, local authorities, rescue services and industry with responsibilities for preparing and implementing emergency preparedness plans.

The Draft Checklist for Action (document no. 3) sets out a series of items, as an *aide-mémoire*, concerning what has to be done in planning and implementing health sector activities in relation to chemical accident preparedness and response. The Checklist is meant to provide guidance to those in the health sector with managerial responsibilities for emergency preparedness planning and for liaison with others in various sectors who have such responsibilities.

2. THE FOUR COLLABORATING ORGANISATIONS

IPCS

Intense international concern about the dangers of chemicals for humanity and the natural environment expressed at the United Nations Conference on the Human Environment, which took place in Stockholm, Sweden in 1972, and the recognition by the World Health Assembly in 1977 of the need for international action, led to the establishment in 1980 of the International Programme on Chemical Safety (IPCS) by the World Health Organization (WHO), the United Nations Environment Programme (UNEP) and the International Labour Organisation (ILO). The IPCS, located at WHO Headquarters in Geneva, was set up to provide an internationally evaluated scientific basis on which countries may develop their own chemical safety measures, and to strengthen national capabilities for prevention and treatment of harmful effects of chemicals and for managing the health aspects of chemical emergencies.

In fulfilling its mandate, the IPCS works with other international, intergovernmental and non-governmental organisations, associations and professional bodies which have important activities in the field of chemical safety. Since its establishment, the IPCS has disseminated international evaluations of some 130 chemicals and groups of chemicals, 700 food additives, two residues of pesticides, and 30 residues of veterinary drugs in food. These evaluations are published in different types of documents adapted to the needs of the user, ranging from the scientist and technical expert, the administrator and decision-maker, to the person at the shop floor. Some 14 volumes have been published on methodology for risk assessment, including validation of test methods. A series of major activities to support national poisons control programmes have been established, including preparation of the INTOX poisons information package and evaluation of the efficacy of antidotes and other substances used to treat the harmful effects of chemicals. Some 50 training courses have been organised throughout the world.

The United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil, in June 1992 recognised the need to ensure the environmentally sound management of toxic chemicals, within the principles of sustainable development and the improvement of quality of life for humankind. The Conference recommended that international work in this area be strengthened and co-ordinated, and that collaboration in a strengthened IPCS should be the nucleus for such co-ordination.

Promotion of effective international co-operation with respect to prevention of, preparedness for, and response to emergencies and accidents involving chemicals, including management of poisoned patients, follow-up of sequelae, and accident site clean-up and rehabilitation, is one of the important aspects of environmentally sound management of chemicals identified by UNCED. The IPCS provides the health and medical aspects of this area of international co-operation.

UNEP-IE/PAC

The Industry and Environment Office (IEO) was established by the United Nations Environment Programme in 1975 in order to bring industry and government together to promote environmentally sound industrial development. The office, which has since become the Industry and Environment Programme Activity Centre (UNEP-IE/PAC), is located in Paris.

Its goals are:

1 to encourage the incorporation of environmental criteria in industrial development plans;

2. to facilitate the implementation of procedures and principles for the protection of the environment;

3. to promote the use of safe and "clean" technologies; and

4. to stimulate the exchange of information and experience throughout the world.

IE/PAC provides access to practical information and develops co-operative on-site action and information exchange, backed by regular follow-up and assessment. Among the tools it has developed to carry out its work are: technical reviews and guidelines; the *Industry and Environment* review; and a technical query-response service.

The Awareness and Preparedness for Emergencies at Local Level (APELL) Programme has also been developed by IE/PAC. The main goal of this programme, launched in co-operation with industry and government, is to prevent technological accidents and their impacts through assistance to decision-makers and technical personnel in improving community awareness of hazardous installations, and in preparing response plans should unexpected events at these installations endanger life, property or the environment.

Over 6000 copies of the APELL handbook in English, French and Spanish have been distributed throughout the world. It is currently available in eleven other languages, and this number is rising all the time. Ongoing APELL activities include: seminar/workshops for senior-level participants from industry, government, academia and non-governmental organisations; the APELL Newsletter, which is published twice a year and appears as a supplement to the *Industry and Environment* review; and the development of complementary materials to help implement APELL. The UN Conference on Environment and Development mentioned the extension of APELL as part of Agenda 21.

WHO(EURO)-ECEH

The Regional Office for Europe of the World Health Organization (WHO/EURO) has played an important role in initiating work on an emergency response to chemical accidents. In the early 1980s, a document on "Administrative Guidelines on Planning Emergency Response Systems for Chemical Accidents" (*Health Aspects of Chemical Safety*, Volume 1) was published. Activities which followed included convening the World Conference on Chemical Accidents in Rome in 1987, and issuing a *Guide for Public Officials on Rehabilitation following Chemical Accidents* in 1989.

In the European Charter on Environment and Health, which was adopted by the Ministers of Environment and Health of the Member States of the European Region of WHO in 1989, one of the priority environment and health issues requiring actions to be taken was "contingency planning for and response to accidents and disasters". It is in this context that the WHO-European Centre for Environment and Health, the establishment of which was a consequence of the adoption of the Charter, views its mandate to co-operate on the development of guidance documents on "Health Aspects of Chemical Accidents". These will be of use to the Centre's work in the area of technical co-operation with member countries, in particular with countries in Central and Eastern Europe.

OECD

The OECD (Organisation for Economic Co-operation and Development) is an intergovernmental organisation grouping 24 industrialised countries.[1] It provides a forum where Member countries discuss issues of common interest and co-ordinate and, as appropriate, harmonize their national policies.

Work on chemical accidents, as part of the OECD Environment Programme, began in 1988 when a special high-level Conference on Accidents Involving Hazardous Substances was hosted by the French authorities. As a follow-up, the OECD Accidents Programme was established to, *inter alia*, develop common principles, procedures and policy guidance related to accidents. A Group of Experts on Chemical Accidents was formed to undertake the work. This Group, composed of national experts nominated by Member countries, as well as representatives of relevant international organisations, works closely with representatives of industry, labour and other non-governmental organisations. It has also sought to include representatives of non-OECD countries in all international workshops and other appropriate activities.

In 1992 the OECD published a comprehensive guidance document, *Guiding Principles for Chemical Accident Prevention, Preparedness and Response*, based on the outcome of several international workshops and numerous consultations. This document sets out guidance for public authorities, industry, labour and others related to all aspects of chemical accident prevention, preparedness and response with respect to fixed installations which manufacture, handle or store hazardous substances. It also includes sections on investments and aid programmes relating to hazardous installations in non-OECD countries. The *Guiding Principles*, already available in English and French, are being translated into other languages including Spanish and Russian. Many thousands of copies have been distributed worldwide.

The OECD has also published two users guides, one to hazardous substance data banks and the other to information systems useful to emergency planners and responders. These users guides allow anyone involved in chemical accident prevention, preparedness and response to learn about the nature of, and how to access, data banks and information systems available in OECD Member countries. In addition, OECD together with UNEP-IE/PAC has published an *International Directory of Emergency Response Centres*.

Among the objectives of the current OECD Accidents Programme are work on the implementation and elaboration of the *Guiding Principles* and increased co-operation with non-OECD countries.

[1] The Member countries are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. The Commission of the European Communities takes part in OECD work, and Yugoslavia has participated in many activities.

3. OVERVIEW OF CHEMICAL ACCIDENTS

Chemical accidents are the result of uncontrolled releases of a substance or substances that are harmful to health, the environment or property. The risk of a chemical accident occurring depends on the characteristics of the substance(s) in question, the quantities handled, and the processes used, as well as the vulnerability of the surroundings and the effectiveness of the emergency measures taken to minimise the accident's consequences.

Chemical products are either elements, formulations or compounds. Preparations can be made up of mixtures of chemicals (for example, paints are a mixture of pigment, resin and solvent).

Chemicals can be dangerous in many ways. They can be toxic, explosive, flammable, corrosive or radioactive. For example, arsenic is well known to be toxic; nitroglycerine, gasoline, hydrochloric acid and plutonium are examples of explosive, flammable, corrosive and radioactive chemicals, respectively.

There are several ways a toxic chemical can be taken in. These include inhalation of contaminated air, absorption through the skin, and ingestion via the mouth. The dose at which chemicals are toxic varies greatly. Exposure to some chemicals leads to general poisoning of the whole body; others only affect certain organs.

Chemical releases in the environment can result in direct poisoning, but they can also have indirect effects. For example, when the biological breakdown of a chemical uses up the oxygen in a river or lake, plants and fish will die. Substances that are difficult to break down, on the other hand, can find their way into the food chain and damage an entire ecosystem.

HAZARDS ASSOCIATED WITH HANDLING CHEMICALS

Hazardous substances are hazardous at all times. For example, gases condensed under pressure, such as LPG (liquified petroleum gas), chlorine, sulphur dioxide and ammonia, are extremely dangerous. Large quantities of these gases are handled. An accident involving them could have grave consequences.

A hazard analysis for a particular locality can rarely include a detailed inspection of the equipment and processes used in a hazardous installation. The competence and resources for this type of analysis should exist within the company operating the installation. From the local authority perspective, the following information is needed for adequate chemical accident preparedness and response:

- which hazardous substances are being handled in quantities large enough to contribute to a serious accident;
- what damage could possibly occur and how widespread it could be;
- whether technical conditions increase the hazard (pressure, temperature, process type, common storage);
- whether there is an understanding of hazards and of the need for safe equipment, safe methods, training, emergency preparedness plans, etc. at the installation in question; and

- whether the hazards require a response from local authorities and, if so, whether adequate response facilities are available.

The greatest hazards appear to exist at large-scale chemical installations. However, knowledge concerning hazards and the need to respond to them correctly has so far prevented a large number of very serious accidents from occurring at such installations.

THE RISK THAT A CHEMICAL ACCIDENT WILL OCCUR

When chemicals are processed, stored or transported, there is a risk of a chemical accident. The nature of the risk will vary according to the chemicals involved, or according to specific conditions. In some cases the form or composition of a chemical product can be altered to make it safer.

The quantity of a chemical handled is an important element in determining risk, although accidents can occur even when this quantity is well below a set safety limit. Technical factors such as the pressure and temperature of a process also affect the risks involved.

Risk increases when two chemicals that react strongly are processed at the same time. A chemical accident can occur when a chemical reacts with another chemical in an uncontrolled way. Mistakes with raw materials, or failure to control temperature and pressure, can cause a reactor vessel to rupture and lead to the unintentional production of highly toxic substances. When a fire takes place, a relatively harmless chemical can be converted into dangerous products which are then spread in the surrounding area as a result of the fire itself or of efforts to put the fire out.

The equipment used and the number of steps in a process may affect the risk of any operation. The administrative measures that need to be carried out to ensure that chemicals are handled safely may include risk analyses of the system, or of the installation as a whole.

The likelihood of a chemical accident occurring is determined to some extent by the conditions in the surrounding area. So-called "external factors" such as landslides, flooding, extreme weather or power cuts can lead to uncontrolled releases of dangerous substances from an installation. Large chemical releases may occur as a result of natural disasters such as volcanic eruptions or forest fires.

Through an increased understanding of risks, and of the safest ways to handle hazardous substances, the probability that a chemical accident will occur can be reduced. In spite of the risks, there have been relatively few major chemical accidents. With proper preparedness and response measures, the effects of such accidents can be minimised should they happen.

ACCIDENTS DURING TRANSPORT OF DANGEROUS GOODS

About 10 per cent of all goods transported are hazardous, according to the OECD. Accidents involving dangerous goods can occur during transport by road, rail, sea or air.

To a large extent, the transport of dangerous goods takes place across national borders. This calls for international co-operation, internationally agreed rules, and sharing of information and experience.

The likelihood that fatalities will result from an accident during the transport of dangerous goods is very low. The consequences of such an accident can nevertheless be extremely serious. For example, a road accident that created much public concern occurred in 1978 at Los Alfaques, Spain, when 200 people were killed as a result of a propylene BLEVE (Boiling Liquid Expanding Vapour Explosion).

Accidents with dangerous goods often occur when these goods are being loaded or unloaded.

OIL FIRES, EXPLOSIONS AND SPILLS

Oil fires and explosions are the most frequent serious chemical accidents. Fires and explosions are major concerns for all those involved in handling, storage and transport of petroleum products, or in clean-up operations following an oil spill.

Various means are used to transport petroleum products, including pipelines, tankers, trains and trucks. A large number of spills take place at the point of transfer from one means of transport to another.

No two oil spills are exactly alike. The behaviour of the oil on water or land depends upon the type of petroleum product involved. Emergency preparedness planning at the local level is the most effective way to deal with any oil spill.

THE CONSEQUENCES OF A CHEMICAL ACCIDENT

Factors such as temperature, precipitation and winds can affect the amount of a chemical released as a result of a chemical accident and its dispersal. Other factors affecting the consequences of a chemical accident may include the distance from the accident site to buildings containing workers or to, for example, houses, hospitals and schools.

Water supplies, lakes, rivers, agricultural land and nature reserves are especially sensitive to chemical leakages. If food or drinking water are contaminated, the consequences of an accident may be widespread, especially if it was not perceived at the time of the accident that such contamination had occurred.

HEALTH ASPECTS OF CHEMICAL ACCIDENT PREPAREDNESS AND RESPONSE

Chemical emergency preparedness planning has developed to a large extent based on legal requirements relating to local emergency response services that operate in the vicinity of designated hazardous installations. By contrast, there are often deficiencies in equivalent health sector planning. It is expected that this Workshop will contribute to improving the health aspects of chemical accident preparedness and response locally, nationally and internationally.

HISTORICAL OVERVIEW OF MAJOR CHEMICAL ACCIDENTS

Table 1 provides a historical overview of some of the major chemical accidents that have occurred in the past 65 years. This table, based on work done by the OECD, is concerned essentially with accidents of anthropogenic origin, and with releases from industrial plants or from vehicles transporting dangerous goods.

Another type of major chemical accident, but one on which data have not been collected systematically, is food contamination. When such an accident occurs, many hundreds or even thousands of victims may be affected. Examples are the contamination of cooking oil in Spain in 1984, at the beginning of the Spanish toxic oil syndrome, and the regular outbreaks in Central Asia of veno-occulsive disease due to accidental contamination of cereals with pyrrolizidine alkaloids.

Studies on chemical accidents in general, and on specific industries, indicate that the majority of accidents that occur within an industrial compound/complex tend to be contained there. This is not always the case, however, as has been seen at Bhopal, Seveso and Chernobyl.

TABLE 1

A HISTORICAL OVERVIEW OF MAJOR CHEMICAL ACCIDENTS WORLDWIDE

Chemical involved	Type of Accident	Consequences		Place/Country and Year
		Fatalities	Injuries	
Phosgene	Release	10	>200	Hamburg, Germany 1928
Methane		136	77	Cleveland, Ohio, USA 1944
Dimethylether				Ludwigshafen, Germany 1948
Phosgene		22	320	Poza Rica, Mexico 1950
Chlorine		7	0	Wilsun, Fed. Rep. Germany 1952
Hexachlorobenzene	Leakage	-	4,000	Turkey 1956
Triorthcresylphosphate		-	10,000	Morocco 1959
LPG (BLEVE)		18	90	Feyzin, France 1966
Liquified ammonia		18	65	Potchefstroom, South Africa 1973
LNG (BLEVE)		40	-	Staten Island, New York, USA 1973
Cyclohexane	Explosion	28	-	Flixborough, UK 1974
Propylene	Explosion	14	104	Beek, Holland 1975
Ethylene	Explosion	4	35	Holland, 1975
Dioxin/TCDD	Release (Evacuation of the entire area)	-	-	Seveso, Italy 1976
Ammonia	Collision/Release	6	200	Texas City, Texas, USA 1976
Ethylene	Explosion	1	15	Texas, USA 1976
Natural gas	Leakage ignited	1	4	Texas, USA 1976
C5 Hydrocarbons	Ignited/Fire	1	2	Puerto Rico 1976
Chlorine	Release (Evacuation of 10,000 people)	-	-	Baton Rouge, USA 1976
Flammable liquid	Explosion	6	NK	Norway 1976
Ammonia	Explosion	30	22-25	Cartagena, Columbia 1977
Ammonia	Release	2	102	Mexico 1977

Chemical Involved	Type of Accident	Consequences Fatalities	Injuries	Place/Country and Year
LPG	Explosion	7	many	Q'atar 1977
LPG	Incident (Evacuation of 2,000 people)	-	-	Jacksonville, USA 1977
Ethylene oxide	Explosion	1	2	Gela, Italy 1977
Vinyl chloride	Release	-	90	Mexico 1977
Propane/Butane	Explosion	1	9	Cassino, Italy 1977
Sulphur dioxide		-	100	Baltimore, Maryland, USA 1978
Methane		52	-	Santa Cruz, Mexico 1978
Hydrogen sulphide		8	29	Chicago, Illinois, USA 1978
Propylene	Leakage + Fire	216	200	Los Alfaques, Spain 1978
Chlorine	Derailment (Evacuation of 216,000 people)	-	-	Mississauga, Canada 1979
Hydrogen cyanide/CO	Fire	25	-	Vienna, Austria 1979
Parathion	Explosion + Fire (Evacuation of 2,000 people)	-	150	Memphis, Tennessee, USA 1979
Propane gas	Explosion	51	1,000	Ortuella, Spain 1980
Sodium cyanide	Fire (Evacuation of 3,5000 people)	-	12	Barking, Essex, UK 1980
Chemical x	Explosion	50	-	Mandir Asod, India 1980
Water treatment chem	Leakage	-	2,000	San Juan, Puerto Rico 1981
?Ammonia	Derailment (Evacuation of >5,000 people)	28	1,000	Cerritos, Mexico 1981
Sodium chlorate	Fire (Evacuation of 300 people)	-	60	Salford, UK 1982
Liquid methyl isocyanate		2,500	20,000	Bhopal, India 1984
LPG	Explosion	650	5,000	Mexico City, Mexico 1984
Phenol	Spillage	-	2 x 10-6	River Dee, UK 1984
Pesticides	Fire (Gross environmental and river pollution)	-	-	Basle, Switzerland 1986
Ammonium bicarbonate	Leakage	-	15,400	Shinxa Province, China 1986
Vinyl chloride	Explosion	17	19	Bulgaria 1986
Fireworks chemicals	Explosion	11	8	Philippines 1986
Methane	Fire	4	1	Italy 1987

Chemical Involved	Type of Accident	Consequences Fatalities	Injuries	Place/Country & Year
Ammonium nitrate	Fire (Evacuation of >6,000 people)	-	-	France 1987
Radioactive chemicals	Reactor Accident	31	>10,000	Chernobyl, Russia 1988
Aluminium sulphate	Water contamination	-	2,500	Camelford, Cornwall, UK 1988
LPG	Explosion	NK	NK	Brazil 1988
Gas/methane	Gas release	NK	NK	Mexico 1988
Methane gas	Explosion	202	1,500	Guadalajara, Mexico 1992

Abbreviations:

BLEVE:Boiling Liquid Expanding Vapour Explosion
CO: Carbon Monoxide
LPG: Liquified petroleum gas
LNG: Liquified natural gas
NK: Not Known

PROVISIONAL PROGRAMME

IPCS/UNEP/WHO/OECD WORKSHOP ON

HEALTH ASPECTS OF CHEMICAL ACCIDENTS

to be held
13th-16th April 1993

in
Utrecht, the Netherlands

HOSTED BY

THE UNIVERSITY HOSPITAL, UTRECHT

This Workshop is being organised by four collaborating organisations: the International Programme on Chemical Safety (IPCS), the United Nations Environment Programme Industry and Environment Programme Activity Centre (UNEP-IE/PAC), the World Health Organisation - European Centre for Environment and Health (WHO-ECEH) and the Organisation for Economic Co-operation and Development (OECD).

Under the auspices of the four collaborating organisations, draft guidance materials covering most health aspects of chemical accidents have been developed. These materials include: (i) a draft guidance document containing general principles; (ii) draft practical guides which provides practical advice on medical issues; and (iii) a draft checklist for action which can be used in developing and testing emergency plans.

At this Workshop, experts from the medical field, as well as other experts who work on chemical accident preparedness and response, are being brought together in order to:

- interact in an international context in order to develop an overview of needs and existing practices and structures;

- exchange practical experiences related to successful emergency operations and related services; and

- provide input to revisions of the draft guidance materials mentioned above.

In addition, there will be an opportunity for participants to demonstrate relevant computerized information systems.

As a result of the Workshop, the draft guidance materials will be finalised and will be used by UNEP in the APELL process and by OECD in its expansion of the Guiding Principles for Chemical Accident Prevention, Preparedness and Response. In addition, the revised guidance materials will be used by the 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 effects on human health of chemical accidents. They will also be used to provide technical input on chemicals to the WHO Programme on Emergency Preparedness Planning which addresses the health aspects of major disasters. Using these materials, training documents will be developed for use by WHO Regional Offices in their chemical safety activities. In particular, the WHO-ECEH will make use of the guidance materials in the field of technical co-operation with their member countries.

IPCS/UNEP/WHO/OECD WORKSHOP ON
HEALTH ASPECTS OF CHEMICAL ACCIDENTS

PROVISIONAL PROGRAMME

TUESDAY, 13TH APRIL

1. Opening Session

14:00 - 15:30

— *Chairman* Dr. T.J.F. Savelkoul (Chairman LOcal Organizing Committee)

— *Welcome addresses*

Commissioner of the Queen in Utrecht
Mayor of Utrecht
Director of the University Hospital
Representatives of

IPCS: Dr. J. A. Haines
WHO (ECEH): Dr. K. Van der Heijden
OECD: Mr. J. Makris, US/EPA (Chairman of the OECD Expert Group on Chemical Accidents)
UNEP: Ms. J. Stevens Industry and Environment Programme Activity Centre)

— *Keynote Presentation*

Chemical Accidents — The Scene: Dr. P.J. Baxter (Department of Community Medicine, University of Cambridge, Fenner's, Cambridge, UK)

— *Introduction of Workshop documents*

Dr. J. A. Haines (Chairman of the International Organizing Committee)

— *Domestic Matters*

Dr. T.J.F. Savelkoul

1530 - 16:00

BREAK

SESSION I

Information needs, systems and services

This session will address the information needs of all the categories of experts involved in medical issues related to chemical accidents and the availability of this information. The following questions, among others, will be discussed: what information is needed; to whom such information should be provided; by whom it should be provided; and how it should be disseminated. The role of the health sector in identifying its needs will be one focus of attention.

16:00 - 17:30

— *Chairman and Keynote Speaker:* Dr. R.F. Cumberland (National Chemical Emergency Centre, Harwell laboratory, UKAEA, Oxfordshire, UK)

— *Rapporteur*: Dr. L. Albert (Consultores Ambientales Asociados SC, Xalapa, Veracruz, Mexico)

— *Presentations by*: Dr. E. Fogel de Korc (CIAT, Hospital de Clinicas, Montevideo, Uruguay); and Dr. L. Albert (Consultores Ambientales Asociados SC, Xalapa, Veracruz, Mexico)

WEDNESDAY 14TH APRIL

9:00 - 10:30 (continuation of Session 1)

— *Presentation by*: Dr. C. Gotelli (CIQUIME, Buenos Aires, Argentina)

10:30 - 11:00

BREAK

SESSION II

Organisation and planning

This session will deal with the range of issues concerning organisation and planning with respect to medical aspects of prevention, awareness, preparedness and response in relation to chemical accidents. The roles and responsibilities of the various parties involved will be addressed. These included national/regional/local government authorities, local health authorities, hospitals/receiving facilities, medical professionals, poison information centres/chemical emergency centres and industry.

11:00 - 12:30

— *Chairman and Keynote Speaker*: Mr. J. Makris (US/EPA)

— *Rapporteur*: Dr. W. Temple (National Toxicology Group, University of Otago, Dunedin, New Zealand)

— *Presentations by*: Dr. E; Soyombo (Federal Ministry of Health, Environmental and Occupational Health, Yaba, Lagos, Nigeria); and Dr. Ja-Kong Koo (Department of Civil Engineering, Korean Advanced Institute of Science and Technology, Taejon, Korea)

12:00 - 14:00

LUNCH

14:00 - 17:00 (Continuation of Session 2)

— *Presentations by*: Dr. M. George (Deputy Chief Medical Officer, Wales, UK); Dr. G. Keck (Veterinary Toxicology Information Centre, Lyon, France); and Dr. W. Temple (National Toxicology Group, University of Otago, Dunedin, New Zealand)

THURSDAY 15TH APRIL

SESSION III

Specific role of the health sector in emergency response

This session will focus on the medical aspects of all parts of the emergency response process. Issues which will be addressed include: health protection of rescue workers; decontamination; provision of medial assistance (at the site, during transport and at the treatment facility); treatment principles; follow-up of victims; and health protection of site rehabilitation workers.

9:00 - 12:30

— *Chairman and Keynote Speaker*: Dr. T.J.F. Savelkoul (University Hospital, Utrecht, the Netherlands)

— *Rapporteurs*: Dr. K. Hartigan-Go (National Poisons Information Centre, Manila, Philippines); and Dr. A. Wong (Centro de Assessoramento Toxicologico, Sao Paulo, SP, Brazil)

— *Presentations by*: Dr. A. Nantel (Centre de Toxicologie du Québec, Centre Hospitalier de l'University Laval, Quebec City, Canada); Dr. K. Hartigan-Go (National Poisons Information Centre, Manila, Philippines); Dr. A. Wong (Centro de Asessoramento Toxicologico, Sao Paulo, SP, Brazil); and Dr. J.M. Havenkaar (Department of Psychiatry, University Hospital, Utrecht, the Netherlands)

12:30 - 14:00

LUNCH

14:00 - 17:30

SESSION IV

Simulation Exercice

During this time there will be a demonstration of a simulation exercise as well as a visit to the Emergency Hospital in Utrecht.

— *Chairman*: Mr. I. Opstelten (Mayor of the City of Utrecht)

FRIDAY, 16TH APRIL

SESSION V

Training and Education

This session will address both training of all relevant medical experts as well as testing of emergency plans. In particular, discussion will focus on training in job specific aspects and in coordination with other groups of experts involved in emergency response operations.

9:00 - 10:30

— *Chairman and Keynote Speaker*: Dr. P. Kulling (Swedish National Poisons Information Centre, Stockholm, Sweden)

— *Rapporteur*: Dr. S.K. Hall (Environmental Health Department, Federal Aviation Administration, Oklahoma city, Oklahoma, USA)

— *Presentations by*: Dr. S.K. Hall (Environmental Health Department, Federal Aviation Administration, Oklahoma city, Oklahoma, USA); Mr. S. Björk (Hydrocare Industrial Safety Academy, Landskrona, Sweden); and Dr. J. Pronczuk (IPCS)

10:30 - 11:00

BREAK

SESSION VI

Conclusions and Closing

11:00 - 12:00

— *Chairman*: Dr. T.J.F. Savelkoul

— *Presentation of Conclusions*: Dr. R. Visser (OECD)

— *Closing Remarks*: Dr. T.J.F. Savelkoul