5. Response Arrangements for Inland-WaterPollution Incidents

Emergency and Post-Emergency Assistance

5.1 In general, responsibility for dealing with major pollution incidents in inland waters is governed by national laws in the country(ies) concerned. In the event of a requirement for international advice or technical assistance, WHO could be involved if there were any implications for public drinking water supplies; FAO if fish stocks, irrigation systems or the food chain could be affected; UNEP for general assessment and monitoring of the ecological effects. The services of MESL could be used to analyse water quality and monitor the spread of the pollution. In the case of an oil spill, IMO could be called on for advice concerning containment and recovery techniques in particular.[16]

5.2 An FAO study in 1978 found over 2000 multilateral and bilateral instruments governing freshwaters. Some of these inter-governmental agreements govern the notification of and response to pollution incidents affecting inland waters (lakes or rivers) that are shared by more than one State. Under the 1963 Agreement on the International Commission for the Protection of the Rhine Against Pollution, five countries bordering the Rhine River participate in an International Warning and Alert Service begun during 1987. Within the Rhine scheme, countries are required to use standard forms for notification and to staff Principal International Alert Centers with qualified personnel who have a dangerous materials manual at hand. Messages within the scheme are relayed in several languages. The Service now provides a model for an European Community project, entitled the Danube Accident, Emergency, Warning and Alarm System, which would cover 12 countries. Architects of this latter plan have not yet decided whether the system should cover all kinds of emergencies and whether it should be a network of Alarm Centers or include a central control unit as well. Development of the system has revealed a need for internationally compatible procedures.

5.4 A number of river basin agreements, such as those which the US has negotiated with Canada and Mexico respectively, provide for early warning and mutual assistance in the event of a transboundary pollution incident. Outside Europe and North America, sub-regional agreements may be developed under the auspices of the regional economic commissions and/or in the context of the UNEP EMINWA programme.[17] In the absence of such agreements, and in the case of waters that are entirely within the territory of one State, there are no specific international arrangements for assistance in case of a major pollution incident (unless it arises from the transboundary movement of hazardous wastes between countries signatory to the Basel Convention.)

5.5 France's Centre de Documentation de Recherche d'Experimentations sur les Pollutions Accidentelles des Eaux (CEDRE) has provided expertise throughout the world in responding to pollution by hydrocarbons or other chemical substances. Although not usually engaged in pollution response activiies, the World Conservation Union (IUCN) office in Pakistan provided in-house

[16] Although the mandate of IMO relates to the marine environment, the Organization could respond to a request relating to inland waters. In a few cases, in Africa, IMO is already involved in relation to inland waters (for transport, for example) and the techniques for mechanical containment and recovery of oil from the sea and from inland waters are similar.

[17] EMINWA is the programme for the Environmentally Sound Management of Inland Water, launched by UNEP in 1984. It aims at promoting the co-operative, environmentally sound and integrated development of international river/lake basins in less developed regions of the world.

technical assistance to remove a chemical spilled into a river. For proper disposal of the chemical, it sought international assistance through UNDP.

Assistance to Prevention and Preparedness (Pre-Emergency)

5.6 At a regional level, the UN/ECE 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes emphasizes the need to prevent, control and reduce the release of hazardous substances into the aquatic environment. Among other things, it seeks to minimize the risk of accidental pollution by developing compatible monitoring and assessment schemes, warning and alarm systems, mutual assistance arrangements, research programmes and information exchange procedures. Parties are urged to apply the "polluter pays" principle regarding issues of responsibility and liability.

5.7 The UN/ECE 1990 Code of Conduct on Accidental Pollution of Transboundary Inland Waters describes additional pre-accident and post-accident measures which countries should take, individually or jointly, to control and reduce accidental pollution (*e.g.*, on-site/off-site contingency plans, early warning and alarm systems, notification of accidents, damage containment and rehabilitation, damage assessment and compensation as well as post-accident surveillance). The Code is concerned with the introduction of hazardous substances (*i.e.*, toxic, persistent and bio-accumulative substances and harmful micro-organisms) into transboundary inland waters as a result of any man-made accident or natural disaster. Both the ECE Convention and Code promote the development of bilateral or multilateral agreements, especially between countries bordering the same waters. Compensation and liability issues are addressed by the UN/ECE 1989 Convention on Civil Liability for Damage Caused during Carriage of Dangerous Goods by Road, Rail and Inland Navigation Vessels.

5.8 The Oil Companies' European Organization for Environmental and Health Protection (CONCAWE) has developed guidelines on emergency planning for and the handling of inland water pollution incidents.

6. Response Arrangements for Land-Based Accidents Involving Hazardous Substances or Wastes

Emergency and Post-Emergency Assistance

UN bodies

6.1 To date, governments have not negotiated a global agreement for early notification and mutual assistance in the event of land-based industrial or other chemical accidents, although a few regional agreements exist, notably in Europe, as described below[18]. Such accidents can occur during the production, transport or storage of hazardous chemicals. They may result in the release of a hazardous substance into the environment, where it can cause direct or indirect injury to human health or other environmental damage. While existing international instruments deal with the prevention of major industrial accidents and the transboundary movement of hazardous waste, no UN agency has assumed the co-ordinating role which DHA, IAEA and IMO play in other emergency response situations In particular, both the International Labour Organisation (ILO) and the United Nations Industrial Development Organization (UNIDO) have concentrated their efforts on emergency prevention rather than response.

6.2 In the event of a land-based emergency involving the release of a hazardous substance, the specialist support that is available within the UN includes:

- -- FAO: technical assistance regarding pesticides or food safety
- -- ILO: technical assistance for on-site occupational health and safety measures;
- -- IPCS:[19] technical assistance regarding public health action and the treatment of poisoning in case of chemical accidents;
- -- UNEP· general technical advice and assistance in (off-site) environmental impact assessments;
- -- UNIDO: technical expertise with different industrial sectors or technology
- -- - WHO. general chemical safety and environmental health assessment and assistance from Regional Offices (especially PAHO and EURO[20]), WHO Headquarters or collaborating centres;
- -- WMO: meteorological and dispersion forecasting

6.3 The emergency unit of WHO and designated focal points in FAO and WMO, enable their respective organizations to respond fairly rapidly to requests for assistance. The UN Centre for Urgent Environmental Assistance (UNCUEA) performs a similar function within UNEP. WMO and UNCUEA operate 24-hour duty services. WHO has access to emergency reserve funds.

6.4 Weather/hydrological data and forecasts, including trajectories and dispersion forecasts, for an affected area, should normally be provided by national meteorological services. WMO can assist in ensuring forecasts from designated regional centres, and advise on and assist in making special arrangements, if needed. However, its role relates more to promoting the long-term

---

[18] In 1987, UNEP's Environmental Law and Institutions Unit prepared two draft conventions similar to the Early Notification and Assistance Conventions administered by IAEA. They were never finalized due to a lack of governmental support at the time

[19] IPCS, the International Programme for Chemical Safety, is a joint programme of ILO, UNEP/IRPTC and WHO It is based in WHO headquarters, Geneva Proposals for a broadening of its mandate and its membership (to include FAO, UNIDO and OECD) are presently under consideration,

[20] WHO/EURO has established arrangements to be able to field assessment teams at short notice

development and availability of these national and regional capabilities. The 24-hour service of WMO in support of IAEA could, in principle, be extended to cover other types of environmental emergency also, but would be of much less relevance in view of the localized nature of the effects and the need for immediate, on-the-spot analysis.

6.5 In addition to its Emergency and Humanitarian Action office, WHO has issued a series of Protocols for Emergency Preparedness and Response, including one on Rapid Health Assessment in Chemical Emergencies (1990). These protocols are intended to assist on-site personnel determine, within 24 hours, the presence of certain chemicals, details about the release, the population at risk, the estimated impact on health and the extent of available response capacity.

6.6 Despite the absence of formal policies or procedures, ILO has rendered fairly rapid technical assistance on an *ad hoc* basis. In the immediate aftermath of the Bhopal emergency in India, ILO sent occupational health specialists to assist the national ministry of labour. When requested, the Organisation has the ability to tap into in-house expertise and usually can obtain the funds needed to dispatch field or headquarters technical assistance personnel.

6.7 The 1989 UNEP Basel Convention on the Transboundary Movement of Hazardous Wastes and their Disposal provides for notification and mutual assistance between states in the case of *transboundary* effects only. However, advice and assistance would, in practice, also be provided in the case of a request from a Party State relating to a purely internal incident. Parties to the Basel Convention recently have been discussing the elements of a liablity and compensation protocol as well as the possibility of an emergency fund to assist Parties in dealing with hazardous waste accidents. The process by which the Secretariat would mobilize assistance, when requested, is yet to be defined. Nevertheless, information is being collected on existing data systems, sources of expertise and other national capacities which might be available for international assistance. Various multilateral and bilateral agreements concerning hazardous waste already have afforded countries a means to seek assistance with other hazardous substance incidents, *e.g.*, the hazardous waste agreement between US and Mexico facilitated the handling of a chemical spill.

Regional or sub-regional bodies

6.8 The UN/ECE Convention on the Transboundary Effects of Industrial Accidents (1992) provides for: (1) contact persons for notification and mutual assistance; (2) information exchange; (3) research and development; (4) mutual assistance especially via bilateral and multilateral agreements; (5) immediate response, containment, minimization, assessment, co-ordination; (6) accident notification; (7) public information and participation; and (8) emergency preparedness and prevention measures. It encourages European countries to enter into mutual assistance arrangements. Acting on this language, Germany has signed bilateral agreements with certain Central and Eastern European countries based on a model instrument. Discussions among these countries also have begun on the preparation of a multilateral (or subregional) agreement with similar terms. To facilitate implementation of the new Convention, the ECE has begun preparing a list of national centres dealing with industrial accidents. Some of these centres have been designated as contact points for the Convention. A recent questionnaire sent to all member countries seeks additional information on countries' response capabilities as well as any bilateral assistance agreements to which they are committed.

6.9 The UN/ECE 1989 Convention on Civil Liability for Damage Caused During Carriage of Dangerous Goods by Road, Rail and Inland Navigation Vessels prescribes uniform rules regarding liability and compensation for locally confined incidents of accidental damage. It may be joined by

states outside the ECE and may serve as a precedent and a model for similar agreements in other regions. Thus far, however, there have been no ratifications. More recently, the Council of Europe has finalized a Convention on Civil Liability for Damage Resulting from Activities Dangerous to the Environment. It is designed to ensure adequate compensation, damage prevention and restitution of environment stemming from activities which involve dangerous substances, micro-organisms, non-ionising radiations and wastes.

6.10 To date the EC's chemical/environmental emergency response capabilities have been limited to marine pollution incidents. Nevertheless, its Civil Defence Unit helped provide on-site assessment expertise and assistance (in the form of equipment/material) during the threatened dam collapse in Montenegro in 1992. In the future, the Unit plans to expand its marine pollution task force and co-operation officers program to cover all ecological emergency situations. The EC's funding of an UNCUEA staff member for almost two years further illustrates its interest in this form of international emergency assistance.

6.11 In a few cases, regional or sub-regional agreements provide for mutual assistance related to industrial accidents, *e.g.*, Agreement between Denmark Finland, Norway, and Sweden on Co-operation over National Territorial Borders with the Aim of Preventing or Limiting Damage to man or Property or the Environment in the Even of Accidents (1989, accession by Iceland) or recent bilateral agreements negotiated between Germany and certain countries of Central and Eastern Europe (implementing the ECE Convention). Generally, however, industrial accidents have not been the subject of many multilateral and bilateral instruments. New economic/trade arrangements (the EC with European Free Trade Agreement countries and Central/Eastern Europe; Brazil, Argentina, Paraguay and Uruguay in the context of Mercosur, and Canada, Mexico and the US in the context of the North American Free Trade Agreement) seem to be encouraging more formal regional co-operation on emergency response.

Bilateral arrangements

6.12 In the absence a formal understanding, countries have provided bilateral assistance (through offices for national civil protection or foreign aid or environmental protection) in the event of a chemical emergency. These *ad hoc* responses have been few in number thus far, but they may increase as global industrialization and urbanization continue. In anticipation of this situation, certain donor countries have begun strengthening/formalizing their ability to meet international requests for such assistance (creating new bodies or establishing standard operating procedures or developing mobile specialized equipment). Examples of these actions include the Government of Norway's decision to enter into an agreement with UNEP which put certain national capabilities at UNCUEA's disposal in the event of an emergency leading to environmental damage and the Government of the Russian Federation's submission to UNEP of a similar draft agreement. Switzerland has provided UNCUEA with ecotoxicological expertise for international assistance on several occasions

6.13 In furtherance of its responsibility to maintain rosters of experts and equipment available for use in environmental emergencies, UNCUEA has attempted to identify existing national capabilities (e.g., special organizations, institutions, task forces or teams) able and willing to render international response assistance. A questionnaire sent to potential resource countries prompted 24 official responses from Canada, Czech Republic, Denmark, Egypt, Finland, Greece, India, Iran, Japan, The Netherlands, New Zealand, Nigeria, Norway, Portugal, Romania, Russian Federation, Senegal, Singapore, Sweden, Switzerland, Tunisia, United Kingdom, United States and Zimbabwe. Information from the responses has been entered into a database which serves as a

provisional roster of a wide varitey of capabilities that could be used in providing urgent environmental assistance.

6.14 In 1991 several countries sent environmental experts and specialized equipment to the Persian Gulf. With the exception of the US, however, countries generally have not provided assistance of this nature on a regular basis. The US has responded to approximately 10 foreign chemical emergencies during the past 10 years, often using a specially-trained team located within the Environmental Protection Agency. A number of European countries now have developed lists of stand-by environmental experts designated either by government ministries or private associations. Development agencies traditionally involved with funding the assistance efforts of others have begun experimenting with the direct mobilization of individuals/teams. Civil protection and environmental agencies have developed environmental crisis management institutions which can co-ordinate both national and, perhaps, international response activities.

National government arrangements

6.15 In general, national fire services in industrialized countries have extensive hazardous materials expertise. They also may operate 24-hour emergency chemical information systems with personnel trained in hazardous materials response. National product registers, dangerous goods registers or poison centres also can serve as sources of emergency information. These are supplemented by emergency booklets or manuals for local fire brigades or police as well as more detailed emergency response cards for specific chemicals. Fire brigades in industrialized countries also usually have some means of drawing on the resources of relevant industry bodies for needed expertise or equipment in the event of an emergency. The techniques for dealing with, and cleaning up after, accidents are continuously developing, but are generally neither known nor available to the authorities in many developing countries

Off-site arrangements by national industry associations and chemical companies

6.16 Since 1971 national chemical industry associations in several countries, with the support and encouragement of government,[21] have developed voluntary mechanisms for responding to chemical emergencies which occur during distribution, *i.e.*, transport, storage and other activities which take place off-site or "outside the fence" [22] These national chemical emergency transport schemes support the public civil protection, fire and emergency services by ensuring a 24-hour information and advice service, and where necessary mobilizing industry experts and specialized equipment to assist at the site of an accident. Components of a typical national scheme usually include:

1. A 24-hour chemical information system which accepts national or international telephone calls (or radio messages in some cases) from emergency responders;

2. Trained operators who can search a database of Material Safety Data Sheets (MSDSs)[23] (usually based on UN transport number which identifies the substance) and

[21] As mentioned earlier, certain national regulations require hazardous materials transporters to have a 24-hour emergency telephone number

[22] AC Schutz (Switzerland), CANUTEC (Canada), CHEMSAFE (UK), CHEMTREC (US), DATACHEM (Australia), PROQUIMICA (Brazil), SIET (Italy), SETIQ (Mexico), TRANSAID (France), TUIS (Germany), TUIS/ERS (Austria), etc Some systems also handle non-transport emergencies involving chemical releases and exposure

[23] MSDSs are manufacturer-written information summaries for specific chemical products Intended to assist safe use of the product, MSDSs describe the product's hazardous properties and health/environmental effects They also give

provide immediate information/advice in response to questions on a certain chemical product; and

3. Access to a network of experts (from industry and/or government, including civil protection, fire, hospitals or medical personnel with toxic chemical expertise, poison centres, Red Cross, transport authorities and private for-hire response teams) who can be contacted for more information on a 24-hour basis and who can provide on-site assistance (based on location and specialization).

6.17 Although similar in structure, these chemical emergency systems vary according to:

* their nature (operated by private industry, government or both)

* the size/extent of their databases (the largest contains 1,200,000 MSDSs and has access to emergency medical or other information but most national systems only store MSDSs on the products manufactured domestically)

* the qualifications of the emergency operators (some are trained scientists or hazardous materials experts--Brazil has contracted fire service personnel-- while others simply read from the MSDS)

* the languages in which the system functions (availability of translation services)

* the number of telephone line and capability for teleconferencing (ranges from 1 to 25 lines)

* the size/extent of the mututal assistance network (number of available response teams; inclusion of government resources or private contractors with trained technical staff and special equipment; limited to manufacturing sites or wider geographic coverage).

6.18 Most of the systems require regular payments from their members and expect those requesting mutual assistance to reimburse the responding party. If the responsible company is unknown, usually assistance will be provided and the costs recovered later. Nevertheless, information and advice over the telephone often are given without charge.

6.19 Several of the systems have published manuals (or sets of information cards like the transport emergency cards or TREMCARDS approved by the European Chemical Industry Council or CEFIC) which give initial emergency response guidance to drivers, fire brigades and police departments. CEFIC now is working on a series of more detailed information cards designed to assist trained personnel, *i.e.*, ERIC or emergency responder information cards for those who already have received training in the handling of hazardous materials.

6.20 Mutual assistance schemes which support these transport emergency centers may involve a national network of participating companies. Otherwise, they may cover major companies in certain regions, identified industrial corridors or companies dealing with certain products (liquified gases, pesticides, etc). Existing mutual assistance schemes among oil companies have begun to

---

instructions on the precautionary measures which should be taken to avoid exposure and the response actions for containment, first aid and clean-up/disposal if a spill or release occurs

extend their co-operation to petrochemical and other chemical enterprises. Certain participating businesses have begun to develop and make available specialized mobile equipment.

6.21 Usage of each system varies according to the length of time it has been in service, *i.e.*, the number of calls generally has risen over time. Emergency requests for information far outnumber the occasions in which response teams are dispatched. One system, which received thousands of telephone calls, dispatched emergency response teams on 38 occasions in 1990. As a rule, these systems have been designed to handle smaller, everyday incidents rather than major accidents with international effects. Membership in the schemes usually includes chemical manufacturers, distributors and carriers. In one country, legislation requiring chemical transporters to have a 24-hour emergency number has tripled membership in the scheme. Newer schemes are being developed in connection with "Responsible Care" programmes in various countries. These programmes are part of a chemical manufacturing industry intiative to continually improve health, safety and environmental performance. Although chemical distributors in some countries have developed similar codes of practice, their associations generally are less developed than those of chemical manufacturers.

6.22 Links from one national system to another have led to the development of small networks within and between Europe and North America. To facilitate this process in Europe, CEFIC has developed the International Chemical Environment Programme (ICE). Based on the German TUIS system, this programme assists the development of additional national systems (through the dissemination of a model scheme) thereby expanding the existing network. Under the ICE network, a national system can draw upon the resources of other national systems in responding to a local fire brigade's request for assistance. However, ICE itself does not serve as a central contact point for entry into the network and has no central funds. Currently, English is the common language of participating centers in France, Germany and the UK but expected expansion of ICE into other European countries heightens the need to resolve the multiple-language problem

6.23 Similar efforts by Canadian and US systems have led to the creation of national systems in Mexico and Brazil and stimulated interest in Venezuela as well as other parts of the world. Further development of such schemes, however, depends upon the interest and strength of national chemical industry associations.[24]

6 24 National industrial chemical emergency systems have not received many international requests for assistance, and they do not wish to take on global responsibilities. As voluntary schemes, they cannot compel their members to respond to chemical emergencies in other countries They also are concerned about the resource demands, costs and liability issues presented by a wider geographic scope. The limitations of the International Chemical Companies Association, which operates as a loose federation (no permanent Secretariat) composed of CEFIC and the national associations from Australia, Canada, Japan and the US, prevent it from being envisaged as a global response mechanism.

[24] With bilateral assistance from Norway, a Norwegian company and a transnational electronic firm, several industrial facilities in Poland are participating in a pilot project which seeks to improve emergency response to a transport accident The scheme (Global Environmental Network for Industry Emergencies or GENIE) monitors, through satellite, trucks carrying hazardous materials and, in case of an accident, enables responders to obtain quick assistance from participating chemical information systems The project exemplifies increased interest in the use of satellites to detect and respond to disasters/accidents

On-site arrangements by multi-national and other chemical companies

6.25 Major--especially transnational--industrial companies usually have well-defined on-site emergency/contingency plans, and the trained personnel and equipment necessary to deal with most emergencies at their main production and storage facilities in all countries. The headquarters offices of transnational industrial companies do not routinely send an emergency team in response to a chemical accident in another country, but they have sent specialists on occasion to respond to chemical-related incidents. Nevertheless, the exploration and production divisions of many major oil companies have well-developed emergency response teams on stand-by. Formal and informal mutual assistance arrangements put these teams at the disposal of other companies as well.

6.26 The chemical manufacturing divisions of multi-national companies also may have designated emergency personnel at headquarters who receive incident reports from individual facilties (in various countries) on a 24-hour on-call basis. Reports may be required for different accident levels ranging from near misses and minor problems to more significant and serious releases. There have been as many as 50-60 reported (usually minor) incidents in a year. Company public relations divisions may assist in response activities by providing useful product or other information when requested. Emergency telephone numbers displayed on product labels also permit emergency responders to call the headquarters office for immediate advice on a 24-hour basis. Generally-speaking, however, emergency capability is the responsibility of local operating facilities.

6.27 Unfortunately, not all potentially hazardous industrial sites in developing countries, nor transport systems carrying hazardous materials in and between such countries have adequate contingency plans. There are also variations in the extent to which arrangements are made for off-site preparedness and response in the vicinity of hazardous sites (and along transport routes), and in pre-planning for mutual assistance between industrial enterprises that have special capabilities in case of accident. Capabilities to respond to chemical emergencies therefore vary considerably both within and between developing countries.

Other non-governmental bodies

6.28 Environmental and other public interest groups rarely become involved in the provision of emergency response assistance. The World Wide Fund for Nature (WWF), however, helped with longer-term environmental remediation in the Persian Gulf WWF's programme on chemicals and pollution prevention has existed only two years, but it has had an emergency network of contacts for much longer. It currently operates 2000 projects in 120 countries with the assistance of field personnel and contractors who possess a wide range of environmental expertise. WWF is in the process of developing a register of such expertise which could be useful if mobilized to respond to a chemical emergency. The organization also has e-mail access to national affiliates and other contact points.

6.29 The role that will eventually be performed by the recently established International Green Cross (IGC) remains uncertain. Originally conceived by Mikhail Gorbachev as a "green helmets" group, which could respond to man-made environmental disasters throughout the world, the IGC has been formed by merger, in 1993, of two separate organizations set up in Switzerland and the Netherlands. Seated in the Hague, the IGC has declared its intention to concentrate its efforts on three main programme areas: (1) facilitating the prevention/mitigation of and effective response to present as well as impending environmental disasters, (2) promoting value change, and (3) advocating the development of an ecological law. As one of its first projects, the operations

division of the IGC (located in Geneva) has decided to build grassroots support for an industry-initiated pilot project in Poland for transport emergency response (see footnote 22). It also has become involved in a Volga river pollution project. Hoever, until IGC national organizations and local chapters grow in number (to date, they exist only in France, the Netherlands and Switzerland), the organization's activities and funding (dependent on contributions and donations) may remain modest.

6.30 The World Safety Organization (WSO), a non-governmental organization of safety professionals, is seeking to promote a global emergency response network based on the "Emergency Response and Incident Control Programme" developed by an American non-profit firm. The proposed project involves uniform training, a database of experts, a central operational centre, a critique panel to review incidents in which the network is activated, border-crossing agreements and a training/response fund.

Assistance to Prevention and Preparedness (Pre-Emergency)

UN bodies

6.31 Many guidelines and codes of practice have been produced in recent years by different bodies concerning the prevention of and the need for preparedness for industrial accidents. This includes ILO, the World Bank, UNIDO and OECD, as well as a variety of professional and industrial bodies. Much of this material, and related training, focuses on on-site preventive measures although they also provide details of what off-site emergency preparedness (contingency) plans should include.

6.32 The new ILO Convention on the Prevention of Major Industrial Accidents, approved in June 1993, calls on employers to notify the government about major hazard installations and to maintain a major hazard control system. This system should contain emergency plans/procedures which limit the consequences of an accident, warn the community and provide public information about incidents. Nuclear and military installations as well as transport systems (other than pipelines) are excluded from the Convention's coverage. Competent government authorities are required to ensure that on- and off-site emergency plans and procedures are drawn up and kept up-to-date. A related Recommendation on the same topic provides for international information exchange on accidents and urges countries to take necessary safety/organizational measures to address the public health and environmental effects of accidents.

6.33 The ILO Convention and Recommendation concerning the Prevention of Major Industrial Accidents, supplemented by a 1988 Manual on Major Hazard Control (MHC) and a 1991 code of practice, build on that organization's experience in assisting countries (notably India and Senegal) in MHC programmes, with funding from UNDP. Other significant ILO activities connected with hazardous releases include its 1990 Convention and Recommendation concerning Safety in the Use of Chemicals at Work (with accompanying 1992 code of practice and 1993 training manual) as well as its 1988 Code of Practice on Safety, Health and Working Conditions in the Transfer of Technology to Developing Countries.

6.34 UNIDO, subject to funding, can provide assistance for preventive measures (*e.g.*, emergency repairs or the overcoming of bottlenecks that could become a potential danger) and for the support of post-disaster rehabilitation. The organization has rosters of experts in various industrial sectors but, as mentioned earlier, does not have the capacity (procedures) to respond rapidly to emergencies. In the past, UNIDO has conducted workshops, technical assistance,

training and issued guidelines on hazardous materials. FAO, in collaboration with UNIDO, is giving close attention to problems associated with the sometimes very large stocks of old/obsolete pesticides that are to be found in some developing countries.

6.35 UNEP's Industry and Environment Programme Activity Center's Awareness and Preparedness for Emergencies at Local Level (APELL) programme is the most notable initiative specifically relating to off-site preparedness planning for technological hazards in developing countries. APELL provides a practical tool for use at the local level, and the programme, which is supported by industry,[25] is expanding in response to requests from individual countries. The APELL Handbook has been translated into more than 13 languages. Through the APELL programme, UNEP and DHA are collaborating in a joint project in Colombia, and similar collaboration is expected elsewhere. Another collaborative project among UNEP (through IE/PAC), IAEA, UNIDO and WHO involves the assessment and management of environmental risk from energy and other complex industrial systems.

6.36 UNEP's International Register of Potentially Toxic Chemicals (IRPTC) and IPCS provide and publish data on hazardous chemicals, including guidelines on the handling of such items and the treatment of casualties. IRPTC provides a routine Query-Response Service, but the Service has never been intended as an emergency response mechanism able to respond to urgent requests for information at any time. Moreover, the chemical data kept in IRPTC's database is directed to the needs of government chemical management offices rather than emergency responders. Other UNEP programmes and information systems which collect information or monitor the global environment are similarly ill-suited for emergency response support, as currently structured.

6.37 In addition to long-standing, substantial programmes on chemical safety and environmental health, WHO has conducted a joint workshop with UNEP and OECD on the health aspects of chemical accidents. It also has conducted meetings in the Asia/Pacific region and the Africa region on planning for chemical emergencies and on technological disasters, respectively. The World Bank has issued guidelines on disaster prevention and preparedness as related to the control of major hazard installations in developing countries. It also has sponsored several symposia on major chemical accidents.

6.38 Safe transport schemes for dangerous goods, such as the UN Recommendations for the Transport of Dangerous Goods, assist emergency preparedness and response by ensuring that chemicals in shipment are properly classified and marked to show their hazardousness. Schemes for road, rail, air and water essentially are harmonized, and many countries have enacted the standards into national legislation. The numbering system used within the Recommendations serves as the primary means of identifying a particular chemical product.

Other inter-governmental bodies

6.39 As an intergovernmental policy body, the OECD collects information on chemical accidents, develops means to measure/monitor the handling of such accidents, publishes guidelines for accident prevention/preparedness/response and prepares directories of information to assist members and non-members. Together with UNEP-IE/PAC, it has published a 1991 International

[25] Until recently, the International Chemical Companies Association (ICCA) has supported the programme through the secondment of a senior consultant. The Chemical Manufacturers' Association of the United States, and the European Chemical Industries Federation (CEFIC), both supported the original development of the programme and the basic handbook

Directory of Emergency Response Centres (being updated). Despite its outreach programme, especially to Central and Eastern European countries, the organization has no emergency response function and has not received any requests for emergency assistance. The OECD expert group on chemical accidents, however, serves as an informal network of national emergency response officials from primary donor countries. In addition, both the OECD and the EC have been collaborating on the development of a gravity scale for industrial accidents ranging from Catastrophe (Level 6) to Anomaly (Level 0); based on the degree of danger presented (nature and quantity of hazardous material), the consequences, and the means used to respond. OECD's 1989 Council Recommendation on the Application of the Polluter-Pays Principle to Accidental Pollution reflects the agreed basis for most international instruments on the subject.

6.40 The EC's major accident reporting system, established by the 1982 Directive on the Major Accident Hazards of Certain Industrial Activities (Seveso Directive), never has been fully developed partly due to countries' inability to report regularly. Currently, the EC is collaborating with the UN/ECE and the OECD in creating a standardized industrial accident reporting system which will be operated by France's Bureau of Risk Analysis and Industrial Pollution (BARPI).

Private industry bodies

6.41 National chemical transport emergency schemes often are supplemented by other programs such as: (1) cooperative efforts between industry and nearby communities to write/implement plans which warn the public of chemical incidents, provide information to responsible emergency authorities and require yearly testing of contingency arrangements, (2) non-emergency chemical information centers and (3) training courses. Other industry activities include the training of police/fire and civil protection services with regard to chemicals as well as the preparation of public information brochures or school education programmes on how to prevent, prepare for and respond to chemical accidents.

6.42 Industry associations such as the Business Council for Sustainable Development and the International Chamber of Commerce (through its World Industry Council for the Environment) support the APELL programme. These organizations, however, primarily are concerned with influencing the direction of environmental policy-making (within both industry and government), especially as it relates to implementation of Agenda 21[26]. One non-profit industry group, the World Environment Center (WEC), has become more active in the field. With funding from the US Office of Foreign Disaster Assistance (OFDA), WEC has been operating a project known as the Local Accident Management and Prevention Programme (LAMP) in selected industrializing countries (Mexico, India, Indonesia and Thailand). Following an APELL workshop, LAMP field personnel work to develop community planning mechanisms centered around particular industrial facilities with potential for accidents/releases. US-EPA guidelines for setting up local emergency planning committees are being adjusted for use in the project. LAMP requires the co-operation of emergency responders as well as local/regional authorities, industry, members of the community and medical/other sectors to develop industrial disaster preparedness strategies. A key part of the project is the inventorying of hazards and capabilities. WEC has received government funding to train government, industry and community representatives on environmental emergency planning. It maintains a roster of (non-standby) volunteers with technical chemical expertise

[26] Depending on the outcome of the GENIE project described in footnote 24 and the wishes of its member companies, WICE may become involved in related response-oriented activities in the future. In fact, the GENIE project was initiated by ICC's International Environment Bureau, a specialized division for technology cooperation which was replaced by WICE in 1993

6.43 Like environmental organizations, trade unions (such as the International Federation of Chemical, Energy and General Workers' Unions) rarely provide international emergency assistance in the case of chemical accidents. They do play a role, however, in investigating accidents, publishing their findings and seeking changes in national/international policy or legislation related to industrial safety. This serves to further emergency prevention and preparedness. Certain national groups of the International Organization of Consumers Unions (IOCU) are involved in emergency preparedness activities although the organization itself has no resources for emergency response. According to its public information brochures the WSO offers a series of certifications in hazardous material training based on approved courses taken at various educational institutions.