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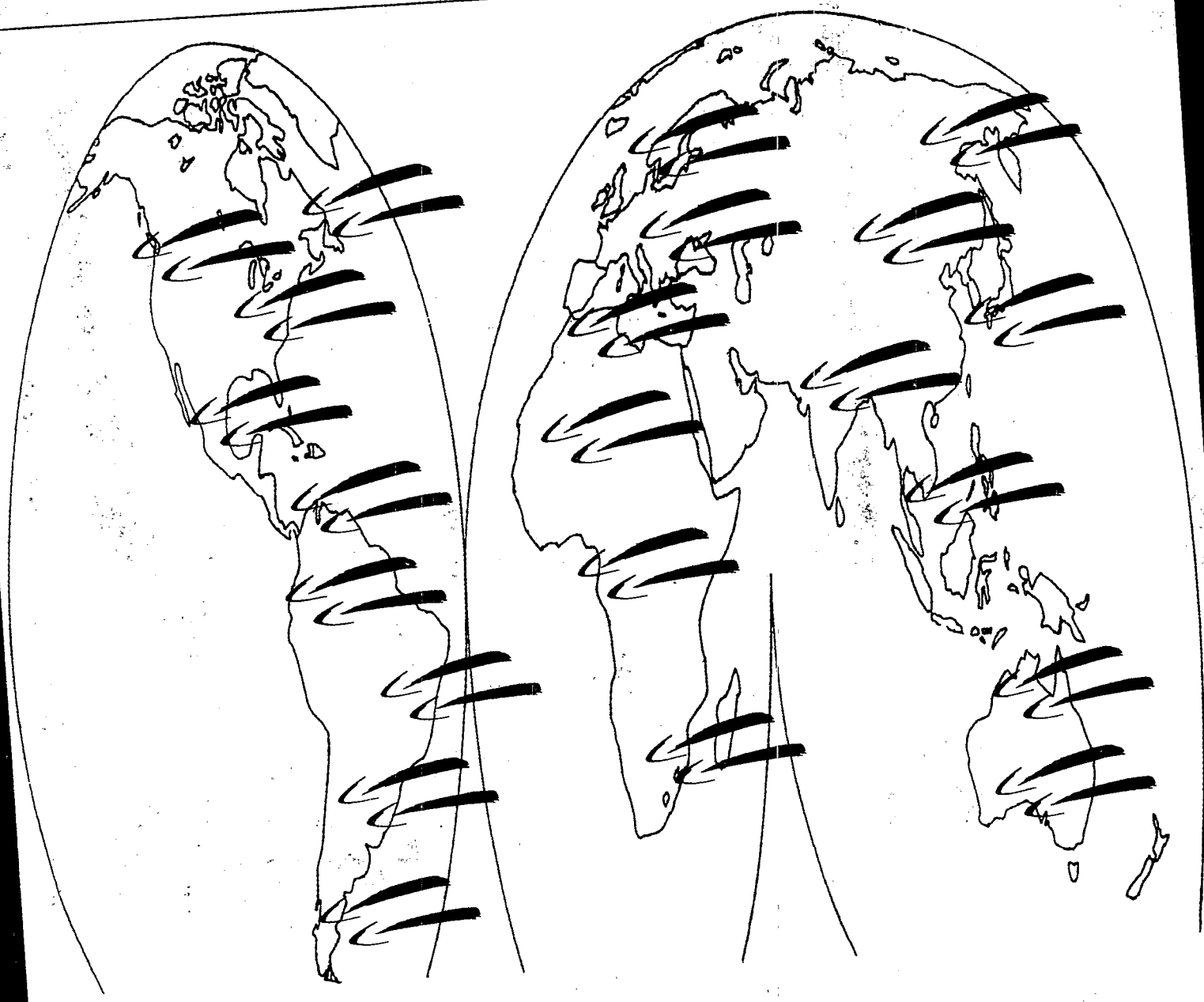
Guiding Principles For Chemical Accident Prevention, Preparedness And Response



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GUIDING PRINCIPLES FOR CHEMICAL ACCIDENT PREVENTION, PREPAREDNESS, AND RESPONSE

Since 1987, the U.S. Environmental Protection Agency's (EPA) Chemical Emergency Preparedness and Prevention Office (CEPPO) has actively participated in the activities involving chemical accidents of the Organisation for Economic and Co-operation and Development (OECD). The OECD is an international organization of 24 industrialized countries from North America, Western Europe, and the Pacific. It meets to compare, co-ordinate, and harmonize national policies, discuss issues of mutual concern, and work together to respond to problems with international dimensions.

As a result of five years of international cooperation, OECD joined with stakeholders from the U.S. and throughout the world to construct an extensive set of ***Guiding Principles on Accident Prevention, Preparedness, and Response***. The Guiding Principles are intended for use by public authorities, industry, labor, and other interested parties in both member and non-member countries. The ***Guiding Principles*** provide a strong foundation for chemical accident programs and are applicable for use throughout the world.

Five workshops on the subject of prevention were held by OECD from 1989 to 1991 in Berlin, Stockholm, London, Boston, and Tokyo. Each workshop had a special theme dedicated to a component of accident prevention: the role of industry, labor, public authorities, emergency response, and human factors. Results of these workshops form the basis of the OECD ***Guiding Principles.***

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GUIDING PRINCIPLES FOR CHEMICAL ACCIDENT PREVENTION, PREPAREDNESS AND RESPONSE

Guidance for Public Authorities, Industry, Labour and Others for the Establishment of Programmes and Policies related to Prevention of, Preparedness for, and Response to Accidents Involving Hazardous Substances

ENVIRONMENT MONOGRAPH No 51

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The OECD (Organisation for Economic Co-operation and Development) is an intergovernmental organisation in which 24 industrialised countries from North America, Western Europe and the Pacific meet to compare, co-ordinate and, where appropriate, harmonize national policies, discuss issues of mutual concern, and work together to respond to problems with international dimensions.

For further information concerning the work of the OECD Environment Programme, including activities related to chemical accidents, contact the OECD Environment Directorate, Environmental Health and Safety Division, 2, rue André-Pascal, 75775 Paris Cedex 16, France.

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Table of Contents

Page

Introduction 7
Background 7
Objective and Scope 9

Section A
Executive Summary 13

A.1 Public Authorities 13
A.2 Management of Hazardous Installations 14
A.3 Employees 16
A.4 Industry in General 17
A.5 Other General Principles 17
A.6 Investments, Technology Transfer, and Aid Programmes Related to Installations in Non-OECD Countries 17

Section B
Prevention of Accidents Involving Hazardous Substances 19

B.1 General Principles 19
B.2 Establishment of Safety Objectives and a Control Framework by Public Authorities 20
B.3 Establishment of a Safety Policy by Industry 24
B.4 Planning and Construction 27
- Hazard Identification and Assessment 27
- Engineering Design 28
- Construction 30
- Transfer of Technology 30
- Acquisitions and Affiliated Operations 31

B.5 Operations 33
- Safety Procedures and Arrangements 33
- Organisation and Personnel 34
- Education and Training 37
- Human Factors 39
- Maintenance 41
- Repairs and Modifications 41
- Storage of Hazardous Substances: Special Considerations 42

B.6 Safety Performance Review and Evaluation 43
- Safety Performance Review 43
- Monitoring by Industry 44
- Monitoring by Public Authorities 45

Page

Section C
Land-Use Planning 47

Section D
Community Awareness 51

Section E
Emergency Preparedness and Response 55

E.1 Emergency Preparedness Programmes and Plans 55
- General Principles 55
- On-Site Emergency Preparedness Plans 58
- Off-Site Emergency Preparedness Plans 59

E.2 Communications 61
E.3 Medical Aspects of Emergency Preparedness and Response 62
E.4 Emergency Response 63
E.5 Incident Reporting and Investigation 65
- General Principle 65
- Reporting 65
- Investigation 66

Section F
Research and Development 69

Section G
Transfer of Technology and International Investment Related to Installations in Non-OECD Countries 71

G.1 General Principles 72
G.2 Transfer of Technology: Role of Technology Suppliers 73
G.3 Transfer of Technology: Role of Technology Exporting Countries 75
G.4 Investments by OECD-Based Enterprises in Hazardous Installations in Non-OECD Countries 76

Section H
Bilateral and Multilateral Technical and Financial Assistance 79

H.1 Aid Agencies 79
H.2 Multilateral Financial Institutions 81

Section I
Acronyms 83

Section J
Glossary 85

Page

Section K
Key Word Index 89

Section L
References 95

L.1 General 95
L.2 Prevention 96
L.3 Land-Use Planning 97
L.4 Community Awareness 97
L.5 Emergency Preparedness and Response 98
L.6 International Investment and Transfer of Technology 99
L.7 Glossary 100
L.8 Contact Points for Publications and Related Information 100

Annex I
Decision of the Council on the Exchange of Information Concerning Accidents Capable of Causing Transfrontier Damage [C(88)84(Final)] . . 103

Annex II
Decision-Recommendation of the Council Concerning Provision of Information to the Public and Public Participation in Decision-Making Processes Related to the Prevention of, and Response to, Accidents Involving Hazardous Substances [C(88)85(Final)] 111

Annex III
Recommendation of the Council on the Application of the Polluter-Pays Principle to Accident Pollution [C(89)88(Final)] 117

Annex IV
Environment Chapter in the Revised OECD Guidelines for Multinational Enterprises 123

To Assist the Reader:

A Glossary will be found in Section J. Some of the terms defined in the Glossary may not be well known. In addition, the meaning of some of these terms may not always be clear in the particular context in which they are used. While an attempt has been made throughout the Guiding Principles to use words in a manner consistent with their common meanings, some words are understood differently in different countries or contexts.

The first time a word found in the Glossary appears in each Section, it has been underlined. This will help the reader know which terms have been defined for the purposes of the text.

Some paragraphs are printed in bold. This has been done to highlight what the ad hoc Group believes are the primary or most general Principles. The bolded paragraphs are often followed by explanatory or more specific text. However, bolding is not intended to signify any special status.

A Key Word Index in Section K will help the reader locate paragraphs that concern a particular subject or party. It contains over eighty terms. The cross-references in this Section refer to related (but not necessarily identical) concepts. In using the Key Word Index, it should be borne in mind that slightly different terms are sometimes used in different parts of the Guiding Principles, even when the same or a closely related topic is addressed.

Introduction

Background

The Guiding Principles set out in this text have been prepared by an expert group, established by the OECD Environment Committee, whose mandate included the development of guidance on prevention of, preparedness for, and response to accidents involving hazardous substances, including the special issues associated with investments and aid programmes related to hazardous installations in non-OECD countries.

In order to develop the basis for the Guiding Principles, the expert group (the OECD ad hoc Group of Experts on Accidents Involving Hazardous Substances, hereinafter referred to as the "ad hoc Group") held a series of Workshops during 1989-1991 to address the range of issues associated with accident prevention, preparedness and response, and to consider the roles and responsibilities of the various parties who are necessarily involved in such activities, i.e. government authorities at all levels, management of hazardous installations, other employees at the installation, and the potentially affected public. Each of the Workshops benefited from the wide range of expertise and perspectives of about 120 participants, generally including representatives from all the interested parties. The Workshops reached a series of conclusions which have been adapted for use as primary input for the Guiding Principles in this document. In preparing the Principles, the ad hoc Group also took into account the various existing international guidance documents. A list of selected references is included as Section L.

To further test the validity and soundness of these Principles, the ad hoc Group widely circulated the conclusions of the Workshops, seeking comments from any interested party.* The ad hoc Group also circulated early drafts of this text to other international organisations, to industry and labour organisations, and to other interested parties both within and outside the OECD Member countries. Representatives of these groups participated throughout the review process.

The work of the ad hoc Group and, in particular, the development of the Guiding Principles, have been undertaken in close co-operation with other international organisations. A number of these organisations, including the United Nations Environment Programme (UNEP), the International Labour Office (ILO), the International Maritime Organization, the World Health Organization, the World Bank, and the United Nations Centre on Transnational Corporations, are very active

* Copies of the reports of these Workshops are available from the OECD. The Workshops were: **Workshop on Prevention of Accidents Involving Hazardous Substances: Good Management Practice**, hosted by the Federal Republic of Germany (Berlin, May 1989); **Workshop on the Provision of Information to the Public and on the Role of Workers in Accident Prevention and Response**, hosted by Sweden (Stockholm, September 1989); **Workshop on the Role of Public Authorities in Preventing Major Accidents and in Major Accident Land Use Planning**, hosted by the United Kingdom and the Netherlands, supported by the Commission of the European Communities (London, February 1990); **Workshop on Emergency Preparedness and Response and on Research in Accident Prevention, Preparedness and Response**, hosted by the United States and Canada, co-sponsored by the United Nations Environment Programme (Boston, May 1990); and **Workshop on Prevention of Accidents Involving Hazardous Substances: The Role of the Human Factor in Plant Operations**, hosted by Japan (Tokyo, April 1991).

in the area of chemical accident prevention, preparedness and response and have prepared guidance materials on related subjects. Most of these guidance materials are listed as references (see Section L). Many of them provide important detailed technical information which can support the General Principles set out in this text.**

Special mention should be made of two documents: the ILO Code of Practice on Prevention of Major Industrial Accidents, and the UNEP APELL (Awareness and Preparedness for Emergencies at the Local Level) Handbook. These documents were prepared during approximately the same period, and aim to provide complementary guidance.

** It should be noted that there are numerous international guidance materials concerning the safe management and control of hazardous substances including, for example, UNEP's *London Guidelines for the Exchange of Information on Chemicals in International Trade (Amended 1989)*, and the Food and Agriculture Organization's *International Code of Conduct on the Distribution and Use of Pesticides (amended 1989)*, both of which incorporate prior informed consent procedures for banned and severely restricted chemicals. While these materials provide important related guidance, only those documents which specifically address chemical accident prevention, preparedness and response have been included as references in these Guiding Principles.

Objective and Scope

The objective of these Guiding Principles is to set out general guidance for the safe planning, construction, management, operation and review of safety performance of hazardous installations in order to prevent accidents involving hazardous substances and, recognising that such accidents may nonetheless occur, to mitigate adverse effects through effective land-use planning and emergency preparedness and response. These Principles provide advice related to the role and responsibilities of public authorities, industry, employees and their representatives, as well as other interested parties such as members of the public potentially affected in the event of an accident and non-governmental organisations.

For purposes of this text, the word "safety" embraces health, safety and environmental protection, including protection of property, to the extent that they relate to prevention of, preparedness for, and response to accidents involving hazardous substances.

As a general matter, employee and public protection, environmental protection and other aspects of industrial safety are closely related and it is beneficial for an enterprise to integrate and co-ordinate various aspects of these areas as much as possible. While this text addresses only those aspects concerning accidents involving hazardous substances, it is recognised that actions taken in conformity with the Guiding Principles will serve to improve overall environmental health and safety performance.

These Guiding Principles apply to all hazardous installations, i.e. fixed plants/sites that produce, process, use, handle, store or dispose of hazardous substances such that there is a risk of a major accident involving the hazardous substance(s). Thus, the Principles apply not only to installations at which chemicals are produced or processed, but also to other industrial and commercial operations at which hazardous substances are handled or stored with a potential for fire, explosion, spills or other accidents involving hazardous substances. Accidents involving the release of radioactive materials have not been addressed, recognising that this subject is already addressed in other international guidance materials. Transport of hazardous substances external to a hazardous installation by means of pipelines, road, rail, sea or air have not been specifically addressed although many of the Principles apply to such transport. These Principles would, however, apply to transfer facilities at which hazardous substances are loaded and/or unloaded.

These Guiding Principles are based on the premise that all hazardous installations should be expected to comply with the same overall safety objectives - that is, the same expectation of safety - irrespective of size, location or whether the installation is publicly or privately owned.

These Guiding Principles have been developed with the recognition that there must be flexibility in their application due to significant differences which exist among countries with respect to, for example, legal and regulatory infrastructures, culture, and resource availability. In addition, there may be differences in approach in applying the Principles to new and to existing installations. Furthermore, these Guiding Principles apply to a wide range of industries and types and sizes of installations.

Thus, while these factors do not diminish the applicability of the Guiding Principles, they may affect the approach taken to implement them. Therefore, consideration

will need to be given to how to implement these Principles in a specific situation.

Throughout the development of the text, the ad hoc Group has worked to ensure that these Guiding Principles are applicable worldwide, not only in OECD countries, and that the text is consistent with the concept of sustainable development. Member countries have agreed to distribute the Principles as widely as possible, working with UN bodies to reach interested parties in non-OECD countries.

These Principles are meant to be comprehensive with respect to accident prevention, emergency preparedness and emergency response. To that end, the text is organised as follows:

- Following an Executive Summary in Section A, prevention is addressed beginning with the role of public authorities in developing safety objectives and a control framework, and the role of industry in establishing safety policies and practices (subsections B.2 and B.3, respectively).

- Principles then follow which are related to planning, construction and operation of hazardous installations, as well as to safety performance review and evaluation as they relate to prevention of accidents (subsections B.4-B.6).

- In the next Section, actions are considered which should be undertaken in order to minimise the adverse effects of residual risks through land-use planning (Section C).

- That Section is followed by one on community awareness (Section D).

- The next Section covers the range of issues involved in emergency preparedness and response (Section E).

- There is also a Section on research and development related to accident prevention, preparedness and response (Section F).

Although the Guiding Principles apply to hazardous installations irrespective of location, the OECD Ministers and other high level officials who met at the OECD Conference on Accidents Involving Hazardous Substances in February 1988 concluded it would be valuable to consider issues which should be emphasized in relation to installations in non-OECD countries. Therefore, separate Sections have been included to address the special concerns involved with:

- transfer of technology and international investments related to installations in non-OECD countries (Section G); and

- bilateral and multilateral assistance programmes (Section H).

There is a list of acronyms in Section I. This is followed by a Glossary in Section J. While attempts were made to use terms in a way consistent with their common meanings, this was not always possible, particularly for terms which are understood differently in different contexts or countries.

Section K is a Key Word Index.

Section L includes a list of references. This is not meant to be an all-encompassing list; rather these publications were chosen because they were considered by the ad hoc Group to be of particular relevance and they are generally available to the public. Section L also includes a list of contact points in OECD countries and in international organisations where it may be possible to obtain information on publications and on programmes related to chemical accident prevention, preparation and response.

Finally, the texts of the three OECD Council Acts referred to in the Guiding Principles, and the Environment Chapter in the Revised OECD Guidelines for Multinational Enterprises, will be found in Annexes I through IV.

Executive Summary

The OECD Guiding Principles for Chemical Accident Prevention, Preparedness and Response deal with the roles and responsibilities of all interested parties including public authorities at all levels, management, and other employees of enterprises operating hazardous installations.

The Guiding Principles address the various issues which may affect safety at a hazardous installation. These include prevention-related issues such as those concerning the establishment of a corporate Safety Policy, the planning, design, siting, construction and operation of the installation, and the review of safety performance as well as the establishment of safety objectives and a control framework by public authorities. In addition, the Guiding Principles address the issues of emergency planning and response in order to mitigate the adverse consequences of any accident that might occur. Other issues covered are land-use planning, community awareness, research and development, and aid and investments related to installations in non-OECD countries.

While the main text is laid out issue-by-issue, this Executive Summary provides an overview of the roles and responsibilities of each of the parties under three main headings: Public Authorities; Management of Hazardous Installations; and Employees. In addition, the Summary includes certain items which are critical to effective accident prevention, preparedness and response but which do not fit neatly under one of the first three headings. These have been included under the headings: Industry in General; Other General Principles; and Investments, Technology Transfer, and Aid Programmes Related to Installations in Non-OECD Countries.

A.1 Public Authorities

(a) Public authorities* should motivate all sectors of society to recognise the need for accident prevention, preparedness and response and to take the measures which are required of each of them.

(b) Public authorities should establish safety objectives and ensure that these objectives are being met. To do this, they should, among other things, establish a clear and coherent control framework. The control framework should set out binding requirements, define which installations are covered, establish notification and information requirements, and provide for enforcement actions for non-compliance with the requirements. Public authorities should also provide guidance to industry and others to help them understand how to fulfill these requirements. A co-ordinating mechanism should be established where more than one competent authority exists.

(c) Public authorities should establish appropriate arrangements for monitoring the safety of hazardous installations by means of both a planned sequence of inspections and visits in response to accidents, complaints, and other indicators that

* The first time a word defined in the Glossary (Section J) is used in each Section of the Guiding Principles, it is underlined.

management control may be inadequate.

(d) Public authorities should require the investigation and reporting by management of accidents. Public authorities should also investigate significant accidents. Public authorities should publish accident information as widely as possible, including any conclusions arising from the analysis or investigation of accident data.

(e) Public authorities should establish appropriate procedures, including planning, siting, licensing and other means for giving permission for a hazardous installation to operate in a given location under certain conditions, and for limiting inappropriate developments in the vicinity of hazardous installations.

(f) Public authorities should ensure that the potentially affected public have the appropriate information concerning hazardous installations and concerning what to do in the event of an accident with off-site effects. Communication with the public should be the joint responsibility of public authorities and industry.

(g) Public authorities, at all levels, should establish emergency preparedness programmes concerning accidents involving hazardous substances. Transport accidents involving hazardous substances should be integrated in these programmes.

(h) Public authorities should ensure the development, implementation, testing and updating of adequate on-site and off-site emergency plans in conjunction with management of hazardous installations and, as appropriate, with the participation of employees and of neighbouring communities. They should ensure that adequate manpower, equipment and financial and other resources necessary to carry out emergency plans are readily available for immediate activation in the event, or imminent threat of, an accident. Emergency response personnel should be educated and trained, on a continuing basis, to ensure that a state of readiness is maintained.

(i) Public authorities should ensure that accident warning systems are available to warn the potentially affected public when an accident has occurred.

(j) Public authorities should facilitate and promote the sharing of information and experience related to accident prevention, preparedness and response among countries and with industry.

(k) Public authorities should actively promote and support research and development related to accident prevention, preparedness and response.

(l) Public authorities should be provided with adequate staff and resources, and the staff should be appropriately educated and trained, in order to carry out their roles and responsibilities.

A.2 Management of Hazardous Installations

(a) Management of hazardous installations has the prime responsibility for designing, constructing and operating a hazardous installation in a safe manner and for developing the means to do so. Therefore, safety - which incorporates protection of health and the environment - should be an integral part of the business activities of an enterprise. This includes the development of a corporate safety culture, as well as appropriate corporate safety policies and

procedures, and ensuring their application by employees at all levels.

(b) All enterprises operating hazardous installations should aim to reach the ultimate goal of "zero incidents", and resources should be targeted to this goal.

(c) The day-to-day management of safety should be the responsibility of local line management at each installation in an enterprise.

(d) Producers of hazardous substances have a responsibility to promote the safe management of any hazardous substance they produce throughout the total life cycle of the substance, consistent with the principle of "product stewardship".

(e) When planning, designing and modifying hazardous installations and processes, management should ensure that hazards are identified and ranked and that the most suitable means of reducing or eliminating the hazards are instituted. Similar analyses should be undertaken for proposed acquisitions and for existing installations that were not subject to a critical safety examination.

(f) Management should ensure that every hazardous installation has written operating procedures necessary for its safe operation.

(g) Management should ensure that the staffing of a hazardous installation is done in a manner which allows for the safe operation of the installation at all times. Management should take all reasonable measures to ensure that everyone employed at a hazardous installation, including temporary employees and contractors, receives appropriate education and training and is competent to perform their duties in the operation of the installation under both normal and abnormal conditions.

(h) Safety measures should be incorporated in the engineering design of a hazardous installation to enhance the intrinsic safety of the installation wherever practicable. This should take into account the fact that safety may be enhanced by: avoiding or minimising, to the extent reasonably practicable, the use of hazardous substances; substituting less hazardous substances for hazardous substances; reducing inventories of hazardous substances; simplifying processes; reducing process temperatures and pressures; and separating people from hazardous substances to the extent possible.

(i) Management should pay particular attention to quality assurance during construction of a hazardous installation.

(j) Management should not engage contractors to perform jobs if this would compromise safety. Management should do business with only those contractors who are able to satisfy the management that the services will be carried out in compliance with all applicable laws and regulations as well as the relevant safety policies of the enterprise. Management should monitor and control safety compliance by contractors.

(k) Management should ensure that effective two-way channels for the transfer of safety information between management and other employees are established at hazardous installations. The regular channels of communication should be reinforced by the establishment of a Safety Committee structure to provide a formal mechanism for consultation on safety matters.

(l) Management should ensure that arrangements exist for the safety assurance of hazardous installations, including provision for the regular

maintenance, inspection and testing of equipment so that the equipment is fit at all times for the purpose for which it was designed.

(m) Management should establish formal procedures to ensure that no repair work or modifications to plant, equipment, processes, facilities or procedures compromise safety.

(n) Management should satisfy itself as to the suitability of storage facilities for its hazardous substances, as well as the competence of the warehousekeeper to undertake the storage required.

(o) Management should establish arrangements for the regular and comprehensive monitoring of safety of all its hazardous installations including those of subsidiary and, to the extent possible, affiliate enterprises.

(p) Management should, in co-operation with appropriate public authorities, provide relevant information to the public concerning the hazardous installation and actions to be taken in the event of an accident.

(q) Management should be responsible for the development, implementation, testing and updating of on-site emergency plans, and for ensuring that appropriate manpower, equipment, financial and other resources are available for immediate activation of the plans, as necessary. Management should provide to those responsible for off-site emergency plans the information they have which is necessary to assess hazards and to develop the off-site plans. There should be close co-operation between those responsible for off-site and on-site emergency planning, and all related on-site and off-site plans should be consistent and integrated.

(r) To form a basis for both off-site and on-site emergency planning, management should identify and assess the types of accidents which could arise at the installation and their likely consequences.

(s) Management should ensure that employees, contractors and visitors are made aware of the relevant provisions of the on-site emergency plans, and of what they should do in the event of an accident.

(t) Management should ensure that systems are in place for the rapid detection of an accident or imminent threat of an accident, and for the immediate notification of emergency response personnel.

(u) Management should investigate all significant incidents in order to identify causes and to undertake remedial actions to correct any deficiencies in technology or procedures.

A.3 Employees

(a) All employees should carry out their jobs in a safe manner and contribute actively to the development of safety policies and practices.

(b) Each employee should be responsible for following established procedures, and for taking reasonable care for his or her personal safety and for the safety of others who may be affected by the employee's acts or omissions at work.

(c) An employee should have the right to refuse to do any task which he/she believes may create an unwarranted risk of an accident involving hazardous substances. The employee should immediately report to management the reason for refusing to perform these tasks, or any situation which could develop into such an accident.

(vi) Employees, and their representatives where they exist, should participate in decision-making concerning the organisation of their activities and the staffing needs of the installation, to the extent that these may affect safety.

B.5.12 Plans for personnel development and rotation of jobs should always be consistent with maintaining operational safety requirements.

B.5.13 Consideration should be given as to whether certain tasks, because of their relationship to prevention of accidents, should be subject to specific management controls; for example, a requirement for a specific authorisation or license for activities such as pressurising tanks and welding.

B.5.14 Sufficient professional safety personnel should be available within an enterprise. Their role should be to remain impartial and independent of line management, to provide expert advice and, as such, to function as the enterprise's safety conscience.

(i) In this regard, safety personnel should:

- have the necessary authority to carry out their responsibilities, and should be seen to have management support;
- interact with, and be respected by, employees at all levels in the enterprise;
- be technically competent, either through specialised training or adequate experience, or preferably both; and
- possess good interpersonal and communication skills.

(ii) The number of safety professionals should be appropriate to the size, technology and complexity of the enterprise.

(iii) Management should consider rotating employees between line management and the safety function in order to increase understanding of safety-related problems, generate better solutions to safety-related problems, and strengthen the "safety culture" within the enterprise.

B.5.15 Each employee should be responsible for following the procedures laid down by management, and for taking reasonable care for his or her personal safety and for the safety of others who may be affected by the employee's acts or omissions at work.

- Each employee should support the ability of others to carry out their jobs in a safe manner, and co-operate actively with management in the application of safety procedures and arrangements.

B.5.16 Safety performance should be considered an essential component of every employee's overall performance and should be reviewed periodically.

- The role with respect to safety of each employee, including managers at all levels, should be clearly defined so that safety performance can be appropriately monitored and reviewed.

B.5.17 Management and public authorities should encourage, and facilitate the ability of, employees to fulfill their role and responsibility. Employees may require the support of unions, confederations and their international organisations to assist them. Employee-management co-operation is a prerequisite to assuring safe operations at hazardous installations.

B.5.18 Effective two-way communication channels for the transfer of safety information between management and other employees should be established at hazardous installations. This will help create and maintain a high level of motivation for all employees to operate the installation safely.

B.5.19 The regular communication channels should be reinforced by the establishment of Safety Committee(s) to provide a formal mechanism for consultation among employees on safety matters. The Safety Committees should support - but not be a substitute for - direct communication among management and other employees, or for individual and line management responsibilities for safety. The use of such Committees enables the maximum benefit to be obtained from employees' practical experience and knowledge, as well as furthering mutual trust and confidence through the actions taken to improve safety.

(i) Safety Committees should operate at different levels in an enterprise and consist of:

- employees at various levels (including Safety Representatives where they exist);
- managers with the authority to implement the Committee's recommendations;
- safety specialists; and
- contractors, where appropriate.

(ii) Safety Committee members should receive safety training and specialist advice as necessary.

(iii) Resources should be available for the Safety Committee to undertake its activities.

(iv) Management should act upon the recommendations of the Safety Committee, recognising that the ultimate responsibility for safety remains with management.

(v) Safety Committee members should not lose any earnings for time spent in activities related to the Safety Committee.

B.5.20 In addition to Safety Committees at individual hazardous installations, the establishment of parallel mechanisms at a corporate, sectoral, national or international level may be considered as a useful means of helping to disseminate safety information and providing input to the relevant decision-making processes concerning safety.

B.5.21 Consideration should be given to the establishment of Safety Representatives at the plant level. Safety Representatives, nominated by employees, represent those employees in consultations with management on matters relating to safety. Safety Representatives should be given specific training related to their role.

B.5.22 No measures prejudicial to an employee should be taken if, in good faith, the employee complains to other employees with responsibilities for safety of what he/she considers to be a breach of statutory requirements or an inadequacy in the measures taken with respect to safety. Management should support this approach if the necessary "open" attitude to safety matters is to be achieved.

B.5.23 An employee should have the right to refuse to perform any tasks which he/she believes may create an unwarranted risk of an accident involving hazardous substances.

Prevention of Accidents Involving Hazardous Substances

The General Principles in B.1 summarise the roles and responsibilities of public authorities, management and other employees with respect to prevention of accidents involving hazardous substances. Each of these Principles is elaborated in subsections B.2-B.6.

B.1 General Principles

B.1.1 The primary objective of safety-related programmes at hazardous installations is the prevention of accidents resulting in harm to human health, the environment or property (recognising that accidents involving hazardous substances may, nonetheless, occur).

B.1.2 The prevention of accidents involving hazardous substances is the concern of all interested parties including public authorities at all levels, industry, employees and their representatives, and the community. For accident prevention activities to be effective, co-operative efforts should be undertaken among all these parties. This co-operation should be based on a policy of openness, which will help increase public confidence that appropriate measures are being taken to limit the risk that accidents involving hazardous substances will have off-site effects.

B.1.3 With respect to prevention of accidents involving hazardous substances, public authorities should set general safety objectives, establish a clear and coherent control framework and ensure, through appropriate enforcement measures, that all relevant requirements are being met.

(i) In this regard, public authorities should establish systems for:

- the identification and notification of hazardous installations;
- monitoring of such installations; and
- ensuring that there is adequate reporting and investigation of accidents.

(ii) Public authorities should be proactive in developing new approaches for accident prevention, in addition to their more traditional reactive role responding to specific public concerns.

B.1.4 Public authorities should take a leadership role in motivating all sectors of society to recognise the need for accident prevention, in identifying the tools needed, and in developing a national culture which promotes accident prevention. Public authorities should co-operate with and stimulate industry (management and other employees) to carry out industry's responsibility to ensure the safe operation of hazardous installations and to achieve the confidence of the public that these installations are being operated safely.

B.1.5 Management of hazardous installations have the prime responsibility for operating their installations safely and for developing the means to do so. Safety should be an integral part of the business activities of an enterprise, and all hazardous installations should aim to reach the ultimate goal of "zero incidents".

(i) Management should establish a corporate safety culture, reflected in

a corporate Safety Policy, and should take appropriate actions to ensure that all employees are aware of their roles and responsibilities with respect to safety.

(ii) For effective accident prevention, safety considerations should be incorporated into, among other things:

- planning and construction of installations;
- operating policies and procedures, including organisation and personnel arrangements;
- monitoring and assessment of safety; and
- operation shutdown.

(iii) This responsibility of management applies to all installations which use, handle, store or dispose of hazardous substances, including those installations not considered part of the chemical industry.

B.1.6 Management should take special care to ensure that safety is maintained during periods of stress at a hazardous installation, such as when there is an economic slowdown affecting the industry or when there are staffing problems.

B.1.7 Management should co-operate with public authorities to assist the authorities in meeting their responsibilities.

B.1.8 Producers of hazardous substances have a responsibility to promote the safe management of such substances throughout their total life cycle, consistent with the principle of "product stewardship".

B.1.9 All employees share responsibility for, and have a role to play in, the prevention of accidents by carrying out their jobs with an active regard for safety, by supporting the ability of others to do so, and by contributing to the development and implementation of safety policies and practices.

B.2 Establishment of Safety Objectives and a Control Framework by Public Authorities

This subsection focuses on the role of public authorities only as it relates to the establishment of safety objectives and a control framework. Their role as it relates to other aspects of accident prevention, as well as to emergency preparedness and response, land-use planning, and provision of information to the public, is addressed elsewhere.

B.2.1 Public authorities should ensure that appropriate safety objectives are established as part of a long-term strategy.

B.2.2 Public authorities should develop a clear and coherent control framework covering all aspects of accident prevention.

(i) The control framework should consist of binding requirements (set out in, for example, laws and regulations) as well as standards, codes and guidance (such as codes of practice, quality assurance guides, etc.). These materials should be designed to enable each interested party to determine whether the appropriate safety objectives are being met.

(ii) The control framework should also include provisions for monitoring the safety of hazardous installations during all phases of their life cycle,

(d) No measures prejudicial to an employee should be taken if, in good faith, the employee complains to other employees with responsibilities for safety of what he/she considers an inadequacy in the measures taken with respect to safety.

A.4 Industry in General

(a) Larger enterprises and trade associations should, as appropriate, offer assistance to small and medium-sized enterprises in meeting safety objectives.

(b) Process or other safety-related technology should not be transferred unless the supplier is satisfied that the technology receiver can apply the technology in a safe manner.

(c) Industry, including manufacturers and processors of hazardous substances and equipment designers, have the primary responsibility for carrying out safety-related research.

A.5 Other General Principles

(a) The Polluter-Pays Principle, with respect to accidents involving hazardous substances, should be applied in accordance with the OECD Council Recommendation [C(89)88(Final)], attached as Annex III.

(b) The media should be provided with appropriate information concerning hazardous installations and should be involved in the emergency planning process in order that they can provide an effective means of communication in the event of an accident. In this function, they should be given access to officials during an emergency so that they can provide essential and accurate information to the public.

A.6 Investments, Technology Transfer, and Aid Programmes Related to Installations in Non-OECD Countries

(a) Industry and public authorities should support the principle that hazardous installations in non-OECD countries should be sited, designed, operated, managed, maintained and monitored so as to meet a level of safety at least equivalent to installations in OECD countries.

(b) The degree of safety of installations which result from an investment by an OECD-based enterprise, or which incorporate process or other safety-related technology transferred from an OECD country, should be the highest level of safety reasonably practicable according to the current state of knowledge.

(c) Transfer of technology from an OECD country to a non-OECD country, or investment by an OECD-based enterprise in a new hazardous installation in a non-OECD country, should only take place once there is reasonable assurance that safe operating conditions can be achieved taking into account local factors.

(d) Transfer of technology related to hazardous installations should only take place if accompanied by appropriate safety technology and information.

(e) The prevention of accidents should be one of the fundamental business considerations taken into account by OECD-based enterprises, as well as by international service organisations and financial institutions, in any investment related to a hazardous installation in a non-OECD country.

(f) Bilateral and multilateral aid agencies should help reduce the likelihood of accidents involving hazardous substances in aid-recipient countries by providing technical assistance, education and training to build institutional infrastructures.

(g) Aid agencies should screen relevant aid proposals to minimise the possibility that aid projects will help create, sustain or increase an unreasonable risk of an accident involving hazardous substances, and should include in any aid projects involving hazardous substances adequate monitoring and follow-up to ensure that essential safety requirements are being met.

(h) Multilateral financial institutions should develop policies and procedures for minimising the risks of accidents at hazardous installations they help to finance.

(ii) In this regard, public authorities should take into account the specific situations of small and medium-sized enterprises.

B.2.9 The requirements and guidance established by public authorities should stimulate innovation and promote the use of improved safety technology and safety practices. The control requirements should be considered minimums; industry should be encouraged to achieve a higher level of safety than would be achieved by adherence to established standards and guidance alone.

B.2.10 The requirements and guidance should be reviewed periodically and, where necessary, amended within a reasonable time to take into account technical progress, additional knowledge and international developments.

- Any amendments to the control framework requiring changes in technology or management practice should allow reasonable time for implementation and compliance by industry.

B.2.11 The control framework should include provisions for the enforcement of requirements, and adequate resources should be available to the public authorities for monitoring and enforcement activities.

- Enforcement mechanisms should include suitable sanctions, with penalties applicable in the event of non-compliance with any of the requirements.

B.2.12 Public authorities should establish procedures for the notification and reporting to them of certain specified categories of hazardous installations.

B.2.13 Public authorities should also establish a system for the submission of detailed information for certain categories of hazardous installations. Under such a system, management of the relevant installations would be required to submit a report describing the major hazards at the installations, and demonstrating that appropriate steps are being taken to prevent accidents and to limit their consequences. (Such reports are known in some countries as "safety reports".)

(i) The public authorities may establish different information requirements for different categories of installations, becoming more stringent for those installations regarded as presenting the greatest potential risk.

(ii) Any such reports should be reviewed regularly and updated as appropriate.

(iii) Public authorities should evaluate the reports received by, for example, examining their completeness, appraising the safety of the subject installation and, as appropriate, carrying out on-site inspections to verify information in the report.

(iv) The information in these reports may be made available to the public, with the exception of legitimate trade secrets.

(v) As an alternative to this reporting system, the public authorities should consider implementing a system whereby detailed technical codes are established as binding requirements. Such codes may include requirements for the engineering design, the construction and the operation of hazardous installations. Where applicable, public authorities should monitor compliance with the codes.

and for the enforcement of requirements.

B.2.3 Public authorities should have available appropriate staff to carry out their role and responsibilities in the prevention of accidents, and should ensure that the staff is adequately educated and trained.

(i) If the expertise necessary for public authorities to carry out their role and responsibilities is not available on staff, arrangements should be made for that expertise to be provided as needed, for example by external consultants or industry.

(ii) The contracts of external experts/consultants employed by public authorities should stipulate that they are not to disclose any non-public information obtained except to the public authority which has contracted their services.

B.2.4 A co-ordinating mechanism should be established where more than one competent public authority exist, in order to minimise overlapping and conflicting requirements from various public authorities.

B.2.5 In establishing safety objectives, as well as the control framework, public authorities should consult with representatives of the other stakeholders including:

- **relevant public authorities including, as appropriate, representatives from neighbouring communities or countries;**
- **industry (management and other employees);**
- **professional and trade associations;**
- **independent experts;**
- **trade unions;**
- **interest groups; and**
- **the public.**

(i) Public authorities should consider the establishment of a consultative committee relating to accident prevention, preparedness and response consisting of, among others, representatives of the stakeholders listed above.

(ii) Special efforts should be made to provide appropriate opportunities for input by the public into decision-making by public authorities.

B.2.6 Public authorities should establish the criteria for identifying those hazardous installations considered to have the potential to cause major accidents. These criteria may, for example, be based upon the specific substances and/or categories of substances present in the installation and their potential to cause serious harm to human health or the environment.

B.2.7 The requirements established by public authorities should be applied fairly and uniformly to ensure that enterprises of all sizes and types, whether national or foreign, are required to meet the same overall safety objectives.

B.2.8 The control framework should allow flexibility in the methods used to meet the safety objectives and requirements.

(i) As appropriate, industry should be allowed to establish the methods for meeting the requirements which are best suited to its own particular circumstances.

B.2.14 Public authorities should consider which installations, or modifications to installations, are so potentially hazardous that the installations should not be allowed to operate without the prior and continuing approval of an identified public authority. In these cases, a form of licensing control could be utilised which would require management to submit full details of all relevant aspects of its projected activity to the authority in advance of siting and startup, and periodically thereafter. There should be an opportunity for public input into these licensing decisions.

B.2.15 Public authorities should establish a requirement for the reporting of certain incidents by the management of hazardous installations (see paragraph E.5.4).

(i) Relevant information in these reports should be made widely available as an aid to the prevention of similar accidents at other hazardous installations.

(ii) Authorities should also establish a system for maintaining accident statistics, for carrying out analyses of collected information, and for disseminating relevant information derived from the analyses.

B.2.16 In order to assist industry in improving safety at hazardous installations, public authorities should consider whether to undertake such additional activities as:

- provision of technical assistance, considering any specific needs of the smaller enterprises;
- promotion of training programmes;
- encouragement of research; and
- fostering of public awareness.

These activities should be conducted in such a way as to avoid influencing the impartial judgment of the public authorities in their primary role of establishing and enforcing safety objectives and requirements.

B.2.17 Public authorities in neighbouring countries should exchange information and establish a dialogue concerning installations which, in the event of an accident, have the potential of causing transfrontier damage. Public authorities should ensure that systems are in place to provide warnings and information to neighbouring countries should an accident occur which can cause harm or damage in these countries (see OECD Council Decision C(88)84(Final), set out in Annex I).

B.2.18 National and, where appropriate, regional public authorities should co-operate internationally to improve prevention of accidents involving hazardous substances as well as to improve emergency preparedness and response. This can be done through bilateral contacts as well as through international organisations at different levels.

- To avoid duplication of effort among international organisations, national authorities should undertake to encourage co-ordination and ensure that different organisations do not adopt conflicting approaches.

B.2.19 Co-operation should be promoted in the preparation of guidance documents across countries, industry groups and international organisations.

B.2.20 A worldwide network should be established to promote the sharing among enterprises and countries of information related to the prevention of, preparedness for, and response to accidents involving

hazardous substances. This is particularly important as a means of providing access to information for those with less capability with respect to the safe handling of chemicals.

B.2.21 Trade associations, local chambers of commerce and other organisations can be a useful means of disseminating chemical accident prevention information to smaller enterprises which might be unaware of the existence of such information.

B.3 Establishment of a Safety Policy by Industry

This subsection focuses on the general policies and practices to be established by industry with respect to safety of hazardous installations. It is followed by Guiding Principles related to the planning, construction and operation of installations (subsections B.4 and B.5). These latter subsections apply largely to the roles and responsibility of management of the installations, but they also address other employees, public authorities and other relevant parties.

B.3.1 Management of a hazardous installation has the primary responsibility for preventing accidents involving hazardous substances, and for developing the means to do so.

B.3.2 Effective overall management of hazardous installations necessarily includes effective management of safety: there is a clear correlation between safely run installations and well-managed operations. Therefore, safety should be an integral part of the business activities of the enterprise, and adequate resources should be made available for taking the necessary measures to prevent accidents and to pay for the consequences of any accidents which do occur (see OECD Council Recommendation C(89)88(Final), set out in Annex III).

B.3.3 All installations in an enterprise should aim to reach the ultimate goal of "zero incidents", and resources must be targeted towards this goal. This goal provides the incentive to achieve the best possible performance and ensures continuous efforts towards greater safety. Progress towards this goal can be furthered by:

- establishing safety-related objectives;
- disclosing these objectives;
- measuring progress towards achievement of these objectives.

If an incident does occur, efforts should be made to learn from it to decrease the likelihood of an accident occurring in the future.

B.3.4 Management should not become complacent if there have not been any accidents at an installation over a period of time; continuous efforts are needed to maintain safety.

B.3.5 Each enterprise should establish a corporate safety culture.

(i) This starts with the visible commitment of the Board members and senior executives of the enterprise, who should set an example and demonstrate leadership by being actively involved in safety issues. In addition to this "top-down" commitment to safety as a priority, there should be a "bottom-up" commitment through the active application of safety policies by all employees.

(ii) Essential elements of the safety culture are the belief that all accidents are preventable, and the establishment of policies which set

(i) Each site within an enterprise should develop its own safety programme which conforms to the enterprise's Safety Policy and which addresses, in greater detail, safety concerns and requirements specific to that site. This programme should be developed with the active participation of employees at all levels and be subject to regular review.

(ii) Senior management should provide the necessary support to line management for safety-related decisions and actions.

(iii) Line management should respond to, or relate to superiors, the proposals and suggestions of other employees related to safety matters.

B.3.9 All employees have a continuing role and responsibility in the prevention of accidents by carrying out their jobs in a safe manner, and by contributing actively to the development and implementation of safety policies and practices. Employees at all levels, including managers, should be motivated and educated to recognise safety as a top priority and its continuing improvement as a main corporate aim.

B.3.10 Producers of hazardous substances have a responsibility to promote the safe management of substances they produce throughout the total life cycle of the substances, from their design through production and use to their final disposal or elimination, consistent with the principle of "product stewardship". Such producers should make special efforts to help prevent accidents during the handling and use of a hazardous substance by downstream users.

(i) Producers of hazardous substances have a responsibility, legally and/or morally, for their products and, therefore, producers should create a full awareness of any potential hazards which can arise in the use, handling, storage or disposal of their products and should provide assistance and/or guidance, as necessary.

(ii) In this regard, producers should provide technology, information and assistance to their contractors, distributors, transporters, customers and users so they can follow appropriate prevention practices.

B.3.11 Enterprises selling hazardous substances should actively try to determine whether their customers have adequate facilities and know-how to handle the substances (including, as appropriate, processing, use and disposal of the substances). If such determination cannot be achieved, judgment has to be exercised to decide whether to accept such customers. If customers are found to be incapable of safely handling the hazardous substances, the seller of the substances should assist the customer in obtaining this capability or else not accept such customers.

B.3.12 Smaller enterprises with limited resources should examine the need for assistance on safety matters from external consultants, professional trade associations and public authorities as well as from suppliers. Suppliers of hazardous substances should be supportive by ensuring that people are available to provide advice in order to achieve an appropriate level of safety.

B.3.13 Larger enterprises and/or trade associations should offer assistance to small and medium-sized companies in meeting safety objectives.

outer limits on acceptable behaviour relating to safety. This culture should encourage initiative and alertness in the interest of safety and guard against complacency, which leads to unsafe acts or practices.

(iii) As part of the safety culture, there should be an obvious commitment to safety in the enterprise. This commitment is evidenced by such practices as:

- good communication on safety issues among management and other employees;
- positive feedback concerning actions taken to increase safety;
- quick response to remedy identified faults;
- financial and career incentives for good safety performance;
- participation of employees at all levels in developing and reviewing safety management procedures;
- obvious management interest in safety performance through personal involvement in safety matters; and
- other actions taken by management directed to having all employees act appropriately with regard to safety.

(iv) The corporate safety culture can be enhanced by an open attitude on the part of management towards the public on safety issues.

B.3.6 Each enterprise should have a clear and meaningful statement of its Safety Policy agreed, promulgated and applied at the highest levels in the enterprise, reflecting the corporate safety culture and incorporating the "zero incident" goal as well as the safety objectives established by public authorities.

(i) The Safety Policy should set out to protect the safety and health of all persons involved in, or who may be affected by, the production, process, handling, use, storage, disposal or elimination of hazardous substances, as well as to safeguard the environment and property.

(ii) The Safety Policy should be widely communicated throughout the enterprise. Management should strive to ensure that the intent of the Safety Policy is understood and appreciated by all employees throughout the enterprise.

(iii) Management and other employees should co-operate to comply with the enterprise's Safety Policy and meet its safety goal.

(iv) The Safety Policy should be reviewed regularly and amended, as appropriate, in light of experience gained.

(v) In developing, reviewing and amending the Safety Policy, management should consult with employees at all levels.

B.3.7 The development and implementation by an enterprise of policies and practices relating to accident prevention and preparedness should be co-ordinated and integrated with its activities relating to occupational safety, health and environmental protection as part of the enterprise's total risk management programme.

B.3.8 The responsibility for day-to-day management of safety should be in the hands of line management at individual installations.

B.3.14 Enterprises and trade associations should take action strongly to encourage enterprises which act less responsibly to meet the appropriate safety objectives.

B.4 Planning and Construction

Hazard Identification and Assessment

B.4.1 When planning, designing and modifying installations and processes, management should ensure that critical examination techniques such as hazard analysis, hazard and operability studies (HAZOP) and fault tree and event tree analysis are utilised, in order that hazards are identified and ranked as early as possible at the various stages of the project (including the research stage) and the most suitable means of eliminating or reducing the hazards are instituted. These studies should take into account abnormal external events such as supply failures, power surges, earthquakes and extremes of weather as well as process hazards. Such studies will indicate where hazards may be reduced through engineering design (see paragraphs B.4.5-B.4.13).

B.4.2 The nature and extent of the consequences which could result from each significant hazard and their likelihood should also be assessed, using techniques such as consequence analysis to ascertain the potential for harm. Reducing either the hazard or its probability of occurrence reduces the risk and increases the inherent safety of the design.

- Techniques such as Quantified Risk Assessment (QRA) can provide guidance for decision-making on such safety issues. QRA allows a relative ranking of risks and provides an aid for determining appropriate preventive measures. However, the numerical results of QRA have little absolute value and, therefore, QRA should not be used indiscriminately.

B.4.3 For existing installations which have not been subject to critical safety examinations, the appropriate hazard studies should be carried out in retrospect.

(i) Such studies will ensure that all hazards have been properly identified and assessed, bearing in mind the current "state-of-the-art". In addition, such hazard studies will indicate where safety can be improved by, for example, substituting hazardous substances with less hazardous substances or less hazardous forms of the substances; reducing storage quantities of such substances or moving them to areas where an accident would have less severe consequences; or making process conditions less extreme.

(ii) Any improvements which would increase the level of safety found to be appropriate should be carried out as soon as practical.

B.4.4 The management of hazardous installations should collate all safety-related information on the process and associated equipment concerning, for example, design, operation, maintenance and foreseeable emergencies.

(i) Such a file or dossier is essential for training as well as operational purposes, and for developing safety reports which may be required by public authorities.

(ii) This process documentation file or plant dossier should include information concerning:

- manufacturing procedures;

- process and operating instructions (including safe startup and shutdown);
- line diagrams of process flow showing key equipment;
- results of safety tests and safety data on raw materials;
- reaction mixtures and products;
- data resulting from hazard studies; and
- waste treatment.

(iii) The process documentation file or plant dossier should be kept up-to-date.

Engineering Design

B.4.5 Safety measures should be incorporated at the earliest conceptual and engineering design stages of an installation, to enhance the intrinsic safety of the installation wherever practicable.

(i) The safety measures should take into consideration the possibility for human as well as technical errors, to make compliance with safety procedures as easy as possible. For example, the design of a hazardous installation should take the human factor into account and be in accordance with ergonomic principles so as to take into account limitations in human performance.

(ii) The engineering design principles concerning safety apply not only to new plant and process design, but also to modifications to existing plants and processes as well as to research activities.

B.4.6 In designing new installations and significant modifications to existing installations, industry should use the relevant, most up-to-date international standards, codes of practice and guidance established by public authorities, enterprises, industry and professional associations and other bodies in order to achieve a high level of safety.

- Such standards, codes of practice and guidance should, however, be considered to be minimum requirements. Since improving safety is a dynamic process which should reflect advances in knowledge and technology, these standards, codes and guidance should be supplemented by guidance developed from within the enterprise (embodied in "in-house" engineering design guides and specifications) as a result of operational experience and specialist knowledge.

B.4.7 Existing installations should be assessed to determine whether they meet these standards, codes and guidance. Appropriate improvements should be carried out as soon as practical.

B.4.8 The design of a hazardous installation should integrate the appropriate equipment, facilities and engineering procedures that would reduce the risk from hazards as far as is reasonably practicable (i.e. all measures to reduce the risk should be taken until the additional expense would be considered far to exceed the resulting increase in safety).

(i) To the extent that safety in the engineering design of an installation can be enhanced, the design of the installation should, for example:

- minimise, to the extent reasonably practicable, the use of hazardous substances;

- substitute hazardous substances with those that are less hazardous, provided this decreases the overall risk of the installation;
- reduce inventories of hazardous substances;
- simplify processes;
- reduce process temperatures and pressures;
- separate people from hazardous substances; and
- include means to contain hazardous substances in the event of an accident.

(ii) Systems designed specifically to increase process safety dealing with, for example, pressure relief and fire and explosion assessment should be included in the engineering design of new and existing hazardous installations, taking into account possible accident scenarios.

(iii) For equipment critical to safety (such as pressure vessels or control instruments), engineering design should be subject to a recognised certification or verification procedure.

(iv) Consideration should be given in the design of hazardous installations to the provision of redundant safety-related utility supplies (such as electricity for control systems).

B.4.9 Processes should be designed to contain, control and minimise the quantity of hazardous intermediate substances to the extent that this would increase safety. Where this is not possible, the quantity of hazardous intermediates produced should be reduced to that required for use in the next stage of production so that quantities held in storage are kept to a minimum.

B.4.10 Systems should be designed so that individual component failures will not create unsafe process conditions (i.e. they should be "fail safe") and/or will be capable of accommodating possible human errors.

B.4.11 Although emphasis should be on inherent safety in design, consideration should be given to the need for "add-on" protective systems, thereby assuring safety through mitigation measures.

(i) Procedures should be designed to minimise the chance of failure and, should there be a failure, to minimise any adverse effects.

(ii) Systems to contain any leaks, spills or firefighting waters that might be released (using, for example, containment walls or catch basins) should also be incorporated in the design of hazardous installations, bearing in mind the quantity of hazardous substances which could be released. If there is a loss of containment, adverse effects may be minimised by other mitigation measures such as fire protection equipment and emergency procedures.

B.4.12 In the design phase, management should ensure there is adequate consideration of the site layout as guided by overall safety goals. Particular regard should be given to:

- the establishment of safe separation distances to minimise any "domino effects";
- the location of hazardous processes and substances relative to the location of critical safety-related equipment and instruments; and

- the local community and environment (see Section C).

B.4.13 Relevant personnel who will be involved in the operation of a hazardous installation should also be involved in the planning, design and construction phases of the installation. Employees, and their representatives where they exist, should participate in decisions concerning the design of their workplace, and should be given the opportunity to provide input in the design, application and improvement of equipment in order to utilise employee "know-how" and experience.

Construction

B.4.14 The management of a hazardous installation should pay particular attention to quality assurance during the construction phase of a project.

(i) Safety checks and inspections should be routinely carried out during the construction phase to ensure that the integrity of the original design is maintained, in that plans are being followed properly, requirements of the hazard studies are being fully implemented, and associated equipment is being correctly installed; and in that the correct materials, methods (such as welding techniques) and tests (such as pressure/leak tests) are being used by suitably qualified employees.

(ii) Any modifications to the original design should be documented, and these modifications should be reflected in quality assurance and safety reviews prior to commissioning and start-up of the installation.

B.4.15 Safety checks should also be carried out at the commissioning and startup phases of a project to ensure that the design intent has been completely fulfilled. Functional tests should be carried out for all components, controls and safety devices critical to the safety of the installation.

B.4.16 An enterprise should purchase equipment only from reputable suppliers, and should formally inspect equipment to ensure that it conforms to design specifications and safety requirements before being put into use.

(i) Information concerning reliability of suppliers should be shared among enterprises.

(ii) Quality assurance (QA) systems can provide useful tools to ensure the conformity of equipment with standards and other requirements.

B.4.17 In the construction of a hazardous installation, an enterprise should do business with only those contractors who are able to satisfy the enterprise that their services will be carried out in compliance with all applicable laws and regulations, as well as in compliance with relevant safety standards and policies of the enterprise, so as not to increase the risk of an accident involving hazardous substances. Contractors should work to the standards set by the management of the installation and, to the extent appropriate, under the direct surveillance of management.

Transfer of Technology *

B.4.18 Whenever an enterprise transfers process or other safety-related technology, management of that enterprise should strive to ensure that the technology will be applied in a way which will result in a level of safety equivalent to that achieved in the

* For Principles relating specifically to the transfer of technology to non-OECD countries, see Section G.

should carry out a hazard evaluation to determine the nature and level of hazards at the installation. The enterprise should also determine the requirements for operating the installation in conformity with the standards of the enterprise.

- The responsibility should be on the "seller" of an existing installation to disclose all known or suspected safety problems associated with the installation involved.

B.4.24 All relevant corporate safety policies and guidelines for accident prevention, preparedness and response should be applicable to acquisitions. When an enterprise acquiring an existing installation concludes, following an assessment, that the installation does not meet the standards of the enterprise or internationally accepted safety levels, the installation should be brought up to such safety levels within a reasonable period of time. In those cases where retrofitting cannot be accomplished to meet these levels, the investing enterprise should inform the public authorities and employees, and employee representatives where they exist, in a timely manner of the situation and their intended plans.

B.4.25 Financial institutions, in determining the level of funding to be provided to enterprises for investment in a hazardous installation, should take into account the amount of resources needed to comply with safety requirements as well as with corporate safety policies and guidelines.

B.4.26 Where an enterprise has an investment in, but not operational control over, another enterprise operating hazardous installations, the enterprise making the investment should consider, where appropriate, entering into contractual arrangements to assist in the establishment and maintenance of safety standards.

B.4.27 An enterprise should regularly audit the safety performance and emergency response systems of all hazardous installations of subsidiaries and, to the extent possible, affiliates, to assure itself that the level of safety at such installations does not unreasonably endanger employees, neighbouring communities or the environment, and is consistent with acceptable safety standards (see subsection B.6 on Safety Performance Review and Evaluation).

B.4.28 An enterprise should provide each of its affiliates and subsidiaries full access to all safety-related information - including newly discovered information, research results, technology, and management techniques which could reduce the likelihood of major accidents or mitigate the consequences should an accident occur - at the location of the affiliate or subsidiary.

B.4.29 Enterprises should maintain records showing which hazardous substances are produced, used or stored at affiliates and subsidiaries, by location, on a world-wide basis in order to be able to share effectively information concerning the potential for accidents involving such hazardous substances.

B.4.30 In the event of a major accident, an enterprise should immediately inform the management of relevant affiliates and subsidiaries of the accident, its probable causes, and recommendations for immediate safety checks. The accident report should also be provided to the management of these affiliates and subsidiaries.

enterprise's own installations using that technology.

(i) Enterprises transferring process or other safety-related technology for hazardous installations have a responsibility to develop the technology and associated operating procedures to enable the installations to be operated to an acceptable level of safety, recognising that certain safety technology may not be appropriate in all locations and that practices of management and other employees can be significantly affected by local cultural and administrative conditions.

(ii) All such transfers of technology should be accompanied by related safety information.

(iii) The technology supplier should provide assistance to the technology receiver for education and training.

B.4.19 Prior to transferring process or other safety-related technology, an enterprise should ensure that a hazard evaluation of the application of that technology is carried out incorporating local ecological, social, cultural, economic and demographic data that might affect the possibility, or consequences, of an accident involving hazardous substances.

(i) The party responsible for carrying out this evaluation - which may differ depending upon contractual arrangements - should have access to all the necessary information and should use currently accepted techniques for the identification of hazards and evaluation of the risks.

(ii) The responsible party should involve local officials and community representatives and should ensure that local officials are given the results of the evaluation.

B.4.20 Technology should not be transferred unless the supplier is satisfied, having conducted a fact-finding study, that the technology receiver can apply and use the technology in a safe manner, taking into account the legal and administrative infrastructure necessary for its safe operation.

B.4.21 There should be a contract governing the transfer of the technology which, among other matters, clearly defines and regulates the division of responsibilities between the parties involved related to effective control of operations, prevention of accidents, and emergency preparedness and response.

(i) If appropriate, this contract should also have provisions relating to the procedure for the handover of a turnkey plant.

(ii) The sections of the contract relating to the areas described above should be available, on request, to competent public authorities and to employees and employee representatives, where they exist.

B.4.22 A handover document should be signed by all parties involved, including contractors, when a hazardous installation involving the transfer of technology has been built to the design specified and its capability to be operated safely, in accordance with specified procedures, has been satisfactorily demonstrated in an acceptance test run.

Acquisitions and Affiliated Operations *

B.4.23 Prior to the acquisition of, or investment in, an existing or planned hazardous installation, an enterprise

* For Principles relating specifically to acquisitions in non-OECD countries, see Section G.

B.5 Operations

Safety Procedures and Arrangements

B.5.1 Management should ensure that each installation in an enterprise has written operating procedures and instructions in order to establish the conditions necessary to satisfy the design intent of the installation and maintain its integrity. These should take into account the relevant standards, codes and guidance in order to ensure that equipment, plant and premises provide a safe place of work under both normal and abnormal operating conditions.

B.5.2 Before new products, processes or equipment are handed over from one department to another (for example, from research to production), management should ensure that there are written, agreed operating procedures and safety instructions in order that knowledge and experience gained in research, development, pilot plant and production are passed on. This handover should be formalised by an appropriately signed handover/clearance report.

B.5.3 Appropriate procedures should exist to ensure that effective protection against accidents involving hazardous substances exists during abnormal conditions such as when critical instruments, alarms and emergency equipment are not available, and during periods of stress at the installation (for example, when there are unusual production demands or an economic decline that affects the installation).

B.5.4 Appropriate arrangements should be introduced at a hazardous installation for the prevention of fires, and should a fire occur, for the protection of personnel, buildings and equipment and for firefighting. These arrangements should make provision for the necessary equipment, procedures, training, testing and personnel.

B.5.5 Appropriate procedures should exist for the safe shutdown and decommissioning of a hazardous installation to ensure that hazards are controlled during the shutdown process and while the installation is out of operation.

- During transition phases of operation of a hazardous installation which involve shutdowns and startups - for example, during maintenance of equipment - special efforts should be made to avoid potential causes of risk such as communication problems and split responsibility, since such phases may involve people who are not fully aware of the details of an installation's operation, policies and procedures.

B.5.6 Appropriate arrangements should be in place for maintaining the security of a hazardous installation to minimise the possibility of, for example, sabotage or vandalism. The management of the hazardous installation should specify those areas of the installation to which access should be restricted or controlled, and implement measures to maintain control and prevent unauthorised access.

B.5.7 Management should endeavour to choose the safest practicable means of transport and the safest practicable routing of hazardous substances being taken from or delivered to an installation in order to, for example, minimise the number of people potentially affected in the event of an accident.

B.5.8 A high standard of housekeeping and operational efficiency should be maintained at a hazardous installation since there is a clear correlation between

these functions and good safety performance.

Organisation and Personnel

B.5.9 Management should ensure that appropriate organisational arrangements for implementing the corporate Safety Policy are established. The line of prime responsibility for the management of safety in the enterprise, as well as individual responsibility for safety, should be clearly defined.

B.5.10 Safety should be a line management responsibility, with accountability for the day-to-day management of safety delegated to local line management at each installation in the enterprise.

(i) Management responsible for an installation should be actively involved in developing and updating the local safety arrangements for that installation, which should be designed to satisfy the broader corporate safety objectives, with the participation of the employees concerned.

(ii) Supervisory staff should receive the necessary means and training to fulfill any responsibilities delegated to it for the management of safety.

B.5.11 Management should be responsible for ensuring that each operation is staffed in a manner which allows for the safe operation of installations at all times. Included in this responsibility are the following considerations:

(i) Management should give special consideration to sufficient staffing during nights and weekends, and to controlling overtime work if it may present an increased risk of an accident involving hazardous substances.

(ii) In planning staffing schedules, consideration should be given to avoiding stress and overwork. For example, hours of work and rest breaks should be compatible with safety requirements. Overtime and rest day working by any individual should not be excessive. A record of all such abnormal hours should be maintained to facilitate control on hours worked.

(iii) The possible need for greater levels of supervision during periods of stress should be taken into account. Special staffing requirements and technical skills posed by startups, shutdowns, abnormal or unique operating situations, and emergency response needs should be identified and met by management.

(iv) Consideration should be given to the physical fitness of employees for their jobs, including those employees whose activities are largely sedentary such as managers and control room employees. In this respect, employees should not be assigned tasks if such assignments may compromise the safe operation of the installation. For instance, employees who are affected by substance abuse should not be assigned certain safety-critical tasks.

(v) Jobs which are unsuitable for assignment to disabled or restricted employees, pregnant women or young employees due to the risk of an accident involving hazardous substances should be identified and, where necessary, special arrangements made on a case-by-case basis to ensure such employees can perform their tasks safely.

installation, including temporary employees and contractors, receive appropriate education and training and are competent in the fulfillment of their tasks under both normal and abnormal conditions. This education and training should cover:

- hazard identification and necessary corrective measures;
- basic emergency procedures;
- correct materials handling procedures; and
- any special hazards unique to their job.

(i) Arrangements should be made to ensure that specialised training needs at all levels are properly identified, form part of a programme aimed at improving safety, and are appropriately satisfied.

(ii) Employees, and their representatives where they exist, should be involved in the development of education and training programmes, the testing of these programmes, and their subsequent revisions.

(iii) This approach to education and training should create the high level of awareness necessary not only to prevent accidents but also to respond to abnormal occurrences quickly and effectively. Ignorance or inadequate information can be a cause of incorrect action.

B.5.31 Safety considerations should be part of the initial induction training given to all new employees to create safety consciousness and commitment.

(i) In addition to the education and training given before taking up normal duties, follow-up education and training should be given regularly.

(ii) During slower work periods, consideration should be given to using employees' free time for education and training activities.

B.5.32 Training should be well-structured to give all employees the skills they need to do the job to which they have been assigned, and be sufficiently broad-based so that employees understand the workings of the plant, equipment and processes.

(i) All employees should be encouraged and trained to think through their assigned tasks and how they can be carried out most safely, rather than just carrying them out mechanically.

(ii) Employees are likely to be more conscientious in their work, and in the application of safety systems and procedures, if their training makes it clear not only what they are required to do but also why the various systems and procedures are necessary.

B.5.33 Consideration should be given to training employees in groups rather than individually, where appropriate, since group training can be an effective way of instilling good safety attitudes in employees, developing positive group behaviour, and establishing increased ability for group members to predict potential safety problems and to develop solutions.

B.5.34 Where appropriate, education and training should be available in languages other than the primary language used at the installation, for example where there are foreign employees or where the installation is located in a multilingual area. Where employees speak different languages, management should consider

(i) The employee should immediately report to management the reasons for refusing to perform these tasks.

(ii) In certain cases an employee, or a Safety Representative where one exists, may interrupt hazardous activities in as safe a manner as possible when he/she has reasonable justification for believing that these activities present an imminent and serious danger to safety.

B.5.24 Employees should be required to report forthwith to management any situations which they believe could present a deviation from normal operating conditions, in particular situations which could develop into an accident involving hazardous substances. Management should investigate these reports. If this does not result in an adequate response, the employee should be entitled to refer the matter to public authorities.

B.5.25 Employees should not be placed at any disadvantage because of the actions referred to in B.5.23 and B.5.24 above.

B.5.26 Specific policies with respect to personal activities which may affect the safe operation of an installation - such as smoking, substance abuse and similar matters - should be agreed on and included in every individual employee's contract or conditions of employment.

B.5.27 Management should ensure that all employees have appropriate personal protective equipment and ensure that it is maintained in good condition. Management should also ensure that regular training is provided in its use. Employees should be responsible for using the personal protective equipment in accordance with safety procedures and policies.

B.5.28 Management should not engage contractors to perform jobs related to the operation of a hazardous installation if this would compromise safety.

(i) Management should only hire those contractors who are competent to carry out the contracted work in accordance with all applicable laws and regulations, as well as the safety policies and standards of the enterprise and any additional practices particular to their task.

(ii) Before contracts are given, management should obtain evidence that the contractors are capable of performing their tasks to a sufficiently high standard of safety. Compliance with these laws, regulations, safety policies and standards should be an integral part of the contract with contractors.

(iii) Management should monitor the safety performance of their contractors and, in general, contractors should be subject to the same safety management systems as employees.

B.5.29 Contractors hired to perform duties related to the operation of a hazardous installation should have equivalent rights and responsibilities with respect to safety as employees. If necessary, special measures should be developed to ensure that contractors' employees are well-informed of the hazards when operating at hazardous installations. Specific site safety information should be made available to contractors' employees.

Education and Training

B.5.30 Management should take all reasonable measures to ensure that all those employed at a hazardous

the need to establish a language as the one used in the event of an emergency, and then to provide the appropriate education and training so all employees can understand and respond correctly to commands during an emergency.

B.5.35 Records should be kept, and maintained up-to-date, of all safety-related education and training of employees including managers, supervisors, technicians and Safety Representatives.

B.5.36 The effectiveness of safety education and training should be regularly assessed to ensure that all employees can carry out the duties for which they are responsible in a safe manner. This assessment process is particularly important in times of change, such as when employees, including managers and supervisors, are being assigned to a new or different installation.

B.5.37 Education and training programmes should be modified to reflect changes in processes used, technology applied, and procedures followed at an installation.

B.5.38 Training should be considered part of employees' jobs for purposes of calculating working time and wages.

B.5.39 The management of hazardous installations should take all reasonable measures to inform on-site employees and contractors of the hazards to which they may be exposed related to accidents involving hazardous substances. Adequate information on hazards (including emergency exposure levels) and on the procedures to be followed for safe handling of all substances used at the installation, manufactured as intermediates, or available for sale, should be obtained, kept up-to-date and disseminated widely, in a language(s) which all employees can understand.

B.5.40 Technological information and assistance related to safety of hazardous substances should be provided by management of hazardous installations to contractors, distributors, transporters and users as well as to employees.

B.5.41 Managers and supervisors should be made aware that they have a special obligation to keep informed about safety standards and risks. They should know and fully understand the properties and behaviour of the hazardous substances being used and the limitations of the equipment and technology. They should be competent to implement the measures to be taken in an emergency.

B.5.42 Every supervisor should ensure that those on his or her team know how to carry out safely the tasks entrusted to them and how to maintain a high level of safety awareness. To achieve this, each supervisor should receive training in communication techniques, safety leadership, accident investigation and reporting procedures, safety and health analyses, and the conduct of safety meetings.

B.5.43 Safety training should be included in the education of engineers and other technical specialists at both universities and schools. To this end, the safety aspects of the design and operation of hazardous installations should be integrated into the relevant curricula. Industry and public authorities should promote this.

Human Factors

B.5.44 Particular attention should be given to the role of human factors in preventing accidents at hazardous installations, recognising that humans will, on occasion, fail and that the

majority of accidents are in some part attributable to human error, meaning human actions which unintentionally exploit weaknesses in equipment, procedures, systems and/or organisations.

(i) In planning all phases in the design, development, operation, maintenance, shutdown and decommissioning of a hazardous installation, management should take into account the possibility that human error can occur so that its effects can be minimised.

(ii) The human factor should be taken into account when hazard identification and assessments are carried out.

(iii) The human factor, including both positive and negative aspects of human behaviour, is applicable to all employees in a hazardous installation including managers and contractors.

B.5.45 The demands of each task which may affect the safe operation of an installation should be carefully analysed in order that employees and their tasks are mentally and physically matched, and employees are not overloaded or excessively stressed, so that they can make the most effective and safe contribution to the enterprise. Mental matching of a task involves consideration of the information and decision-making requirements as well as the perception of the task; physical matching includes consideration of the design of the workplace and working environment.

B.5.46 Employees should be encouraged to share their experiences in order to reduce the risk of human error. This can be accomplished through, for example, safety workshops, discussions of near-misses and other group discussions, as well as by inspection and observation of the workplace by employees and, where appropriate, by Safety Representatives.

B.5.47 Experiences relating to human errors should also be shared among different companies and, to the extent possible, among public authorities.

B.5.48 Training and education programmes for all employees should deal with the issue of human errors, including the underlying causes and prevention of such errors. These programmes should also take into account ergonomics and the employee/machine interface (see paragraphs B.5.30-B.5.43 on Education and Training).

B.5.49 Special care should be taken during periods of stress to avoid human errors which could lead to accidents. Management should make it clear that safety considerations take precedence over other considerations. Stress affecting safety could result from pressure on individuals or groups of employees or on the enterprise as a whole (for example, to increase production or cut costs).

B.5.50 In their monitoring activities, both management and public authorities should consider the role human errors might play in increasing the potential for accidents involving hazardous substances. They should consider the potential for errors both in the use of equipment and in following procedures (see subsection B.6 on Safety Performance Review and Evaluation).

B.5.51 It should be recognised that human error outside the hazardous installation can contribute to the increased risk of an accident or adverse effects in the event of an accident. For example, public authorities should take into account the fact that human error in

B.5.56 In the case of any changes made to a process which could affect safety - for example, use of different process materials, alterations of conditions, increase in batch size, or use of larger/different equipment - the original hazard analysis should be reviewed and the process documentation file or plant dossier supplemented accordingly.

- Techniques should be developed to assess how a series of minor changes, taken together, could affect safety at an installation and what could be done to mitigate any increased potential for accidents.

B.5.57 After repair, modification, and/or overhaul of plant and equipment, the necessary test runs and safety checks should be carried out in the presence of the supervisor responsible for the operation of the installation, who should be required to formally approve the restarting of operations.

B.5.58 Procedures should also exist to ensure that changes in management, other personnel and organisation do not compromise safety. Such changes should trigger review procedures to ensure safety has not been adversely affected.

Storage of Hazardous Substances: Special Considerations

While all the Guiding Principles in this document apply to storage facilities for hazardous substances, storage presents special risks or concerns which warrant additional guidance. These apply to both on-site (at the installation) and off-site (contract) storage, including bulk storage (for example, in tank farms) and non-bulk storage (for example, of packaged goods). Only paragraph B.5.59 relates exclusively to the situation where the storage facility is off-site. The warehousekeeper, for purposes of this text, is the person responsible for the storage facility, whether on-site or off-site.

B.5.59 The management of an enterprise seeking to store hazardous substances off-site - including products, raw materials and intermediates - should satisfy itself as to the suitability of the facility for the storage of such substances, and of the competence of the warehousekeeper to undertake the storage required in a safe manner. This could involve the enterprise monitoring the storage facility and training employees of the off-site facility.

B.5.60 The warehousekeeper should ensure that all relevant legislative requirements and applicable codes of practice for the safe storage of hazardous substances are strictly applied wherever applicable.

B.5.61 The owner/supplier of the hazardous substances being stored should provide the warehousekeeper the information necessary to prevent accidents and to respond appropriately should an accident occur.

(i) In this regard, the owner/supplier should provide a material safety data sheet (MSDS) or product data sheet so that the warehousekeeper can ensure that physical, chemical and (eco)toxicological, and other properties relevant in the case of an accident are understood by all relevant employees working in the storage facility.

(ii) Particular attention should be given to proper labeling of hazardous substances, indicating any hazardous properties on labels and the appropriate precautions to be taken.

(iii) In addition, the owner/supplier of the hazardous substances should provide information concerning reaction

land-use planning, in emergency planning, or in emergency response can affect the safety of a hazardous installation or aggravate effects of an accident.

Maintenance

B.5.52 Management of hazardous installations should establish programmes for the regular maintenance, inspection and testing of equipment to ensure that it is at all times fit for the purpose for which it was designed.

(i) Maintenance programmes should be adhered to strictly and should be reviewed periodically to ensure they continue to be appropriate in relation to safety requirements.

(ii) Maintenance standards should be developed to help guarantee the safety of each operation.

(iii) Maintenance jobs should be performed according to established maintenance procedures.

(iv) Records should be kept of all safety-related maintenance work carried out, and equipment reviews and reliability assurance procedures should be established.

(v) Records should be kept of any faults found during maintenance of equipment which might materially affect safety, and prompt action should be taken to rectify the faults.

B.5.53 The local management at each hazardous installation should regularly inspect and maintain emergency alarms, protective and emergency devices, and all devices critical to the orderly shutdown of operations in conjunction with the relevant public authorities, where appropriate.

Repairs and Modifications

B.5.54 The management of a hazardous installation should establish formal procedures to ensure that no repair work or modifications to plant, equipment, processes, facilities or procedures compromise safety.

(i) Modification procedures should apply to both permanent and temporary changes, and should be based on appropriate up-to-date process documentation and, where appropriate, a physical inspection of the installation.

(ii) All modification proposals should be registered and assessed so that the necessary hazard studies are carried out, the appropriate design considerations are made, and the changes proposed are properly engineered and recorded.

(iii) Major modifications should be subject to the same notification and reporting requirements as new installations (see, for example, paragraphs B.2.12-B.2.14).

B.5.55 Proposals for significant modifications should require a review by competent technicians who are independent of those directly responsible for the proposal.

(i) The level of management approval necessary for a modification should be based on the associated level of risk.

(ii) Supervisors having the authority to make a modification, for example to a manufacturing procedure or operating instruction, should be fully aware of the hazards involved and should consult the relevant competent specialist(s) before initiating such a change.

and/or decomposition products formed in the event of a fire.

B.5.62 The owner/supplier of hazardous substances should consider reducing the amount of hazardous substances requiring storage, off-site and/or on-site, if this would reduce the adverse consequences of an accident involving the hazardous substances.

B.5.63 A storage facility should be designed taking into account the nature of the hazardous substances to be stored in the facility.

(i) The design of the facility should allow for the separation of incompatible substances and subdivision of inventories by the use of separate buildings, fire walls, etc. and, for example, should enable access for inspection of hazardous substances, reduce the likelihood of domino effects should an accident occur, and permit firefighting.

(ii) In designing such facilities, particular attention should be given to incorporating automated systems for handling hazardous substances, which reduce the risk of an accident involving such substances.

B.5.64 Storage facilities should incorporate safety features to prevent accidents and to reduce the adverse effects in the event of an accident. For example, security measures should be in place and fire protection equipment should be available. Adequate catchment facilities should be provided to facilitate the activation of spill mitigation procedures to protect the environment in the event of an accident.

B.5.65 A storage plan should be drawn up by the warehousekeeper showing the nature of the hazardous substances in each part of the storage facility.

(i) The storage plan should be made available to the relevant local public authorities (for example, fire services).

(ii) Information concerning hazardous substances held in a storage facility should be maintained up-to-date.

B.5.66 Procedures should be established at storage facilities to prevent the risk of degradation of hazardous substances or packages as well as labels or other markings. Good housekeeping practices should be initiated to prevent accidents.

B.5.67 In order to prevent explosions and fires, consideration should be given to whether the conditions of storage (including, for example, temperature and pressure) create special risks. Consideration should also be given to avoiding potential sources of ignition such as smoking, welding, and shrink wrapping equipment. All power equipment should be specially protected, as necessary.

B.6 Safety Performance Review and Evaluation

Safety Performance Review

The premise of this subsection is that hazardous installations should be subject to periodic safety performance reviews and evaluations. The nature of these reviews and evaluations, and the roles and responsibilities of management, other employees and public authorities are set out below.

B.6.1 Safety performance in hazardous installations should be periodically reviewed in order to:

- **assess achievements with respect to the general goals set;**

- **determine how well specific safety-related policies and decisions have been put into practice;**
- **focus resources where improvements are most needed;**
- **provide information to justify the adjustment or upgrading of goals and achieve further improvements;**
- **demonstrate management's commitment to safety and provide motivation for improvement;**
- **provide a basis for recognising good and inadequate performance;**
- **provide information on safety achievements to the public authorities, community, shareholders and non-governmental organisations; and**
- **provide input into education and training activities.**

B.6.2 Public authorities and industry, with the involvement of employees, should develop proactive/positive indicators of safety performance as well as methods of assessing achievements in risk reduction. While changes in lost-time accident rates have been used and have some value in measuring safety performance, they are reactive indicators and provide only part of the total safety picture.

B.6.3 Systematic safety improvement programmes should be developed by management, with the involvement of other employees, at each installation.

(i) These programmes should be regularly reviewed to ensure an improving trend in safety performance is achieved.

(ii) Such proactive safety schemes should be promoted by public authorities.

Monitoring by Industry

B.6.4 Management should ensure that every hazardous installation is subject to a comprehensive system for monitoring safety, covering both technical and management aspects, including hardware and procedures. Management should continually review its operations to ensure that no previously unrecognised risks have been introduced and that there is the required degree of compliance with the relevant national and international legislation, standards, codes and guidance as well as the enterprise's own requirements and guidance. By doing this, any needs for additional, new or improved standards, hardware and/or procedures should be revealed.

(i) The approach to monitoring should be systematic. In this regard, a monitoring plan should be developed at each installation, "owned" and primarily implemented by the local management, and with flexibility built in to avoid it becoming routine.

(ii) The monitoring plan should include regular inspections at the workplace, periodic detailed checks on specific activities and procedures, and an overall audit of performance.

(iii) The monitoring plan of an installation should form the basis of a hierarchy of annual safety assurance reports, from the manager responsible for an installation to division/business/ company/enterprise executives and subsequently to the Chief Executive Officer of an enterprise.

(iv) Emphasis in monitoring should be on those aspects vital to the safety of the particular installation, as revealed by the hazard evaluations. Some general aspects will need to be covered in all monitoring, such as:

B.6.11 Public authorities should ensure that guidance is prepared for those with compliance obligations on how they can best meet their obligations and satisfy the monitoring/enforcement authorities.

B.6.12 Public authorities should use monitoring as a means of providing support to the management of hazardous installations, consistent with the authorities' enforcement responsibilities. Monitoring provides an opportunity for the public authorities to help management identify weaknesses in their organisation and in their safety arrangements, as well as to provide advice or details on where further information and assistance should be sought. This may be particularly important in the case of small and medium-sized enterprises.

B.6.13 For monitoring to be effective and credible, the monitoring authorities should be publicly accountable. This can be achieved by making the system transparent. To this end, the monitoring authorities should publicise their objectives, procedures and the results of monitoring the safety aspects of hazardous installations.

organisation and management; training; plant integrity; fire protection and prevention; accident/dangerous occurrence investigation and reporting; and emergency procedures.

(v) The potential level of risk should be a significant factor in determining the frequency of monitoring.

B.6.5 In addition to any changes in response to legal requirements, improvements suggested by monitoring should be made where such improvements are reasonably practicable and contribute to the ultimate goal of "zero incidents".

B.6.6 Management should, as appropriate, utilise auditors independent of the local management and employees to monitor hazardous installations. Such an approach using, for example, expert consultants or the enterprise's central safety services can be a valuable means, in certain cases, of raising safety performance by providing another, more independent, viewpoint. Insurance companies may provide a useful service in this respect, especially to small and medium-sized enterprises.

B.6.7 A statement of an enterprise's safety and health performance should form part of the yearly report to its shareholders and employees.

Monitoring by Public Authorities

B.6.8 Public authorities should establish appropriate arrangements for monitoring the safety of hazardous installations in all phases of their life cycle, including planning, design, construction, operation (including maintenance) and decommissioning. When monitoring hazardous installations, public authorities should assess the safety performance of the operation both in terms of meeting technical standards and ensuring that management systems are adequate and effective (that is, systems/procedures as well as the hardware). By proactive monitoring of hazardous installations, public authorities should check, on an equitable basis, industry's compliance with relevant requirements and practices and help to promote industry action beyond minimum requirements.

(i) Monitoring of existing installations should be carried out by means of both a planned sequence of unannounced or announced inspections, and visits in response to accidents, complaints and other indicators that safety performance may be inadequate.

(ii) Public authorities should decide on the frequency and nature of planned inspections, commensurate with the resources available to them and the risks presented by the installation, using some form of priority rating system.

(iii) Public authorities should have free access to hazardous installations and be provided with the information necessary to conduct inspections and audits.

B.6.9 Public authorities should be given sufficient resources and personnel to carry out their monitoring function. Public authorities' inspectors should receive the training and have the necessary expertise to determine, for example, whether the approaches taken in a hazardous installation will achieve the legal safety requirements.

B.6.10 Public authorities' inspectors should be empowered to initiate enforcement action to remedy any serious defects which they discover during any monitoring.

Section C

Land-Use Planning

This Section addresses land-use planning as an essential element in the strategy of controlling major hazards. Land-use planning is complementary to, but not a substitute for, other preventive and mitigatory measures.

C.1 Public authorities should establish land-use planning arrangements to ensure that new hazardous installations are appropriately sited with respect to protection of health and environment, including property, in the event of an accident involving hazardous substances. These arrangements should also prevent the placing of inappropriate developments near hazardous installations and should control inappropriate changes to existing installations.

- Land-use planning should consist of two elements: general zoning for hazardous industrial activities, taking into account all aspects of protecting health and the environment, including property; and case-by-case decision-making concerning the siting of a new installation or proposed development near an existing installation.

C.2 Land-use planning arrangements, as well as related control mechanisms, should provide a clear indication of the standards to be met, and of the evaluation procedures used by public authorities, both for new hazardous installations and for proposed developments in proximity to existing installations.

C.3 Public authorities should establish general guidelines to identify which proposals for new installations or for other developments may increase the risk of a major accident or of any adverse consequences in the event of a major accident.

(i) In addition to proposals for new hazardous installations, such guidelines should cover significant modifications to existing installations and significant development in the vicinity of existing installations.

(ii) The guidelines should take into account such factors as:

- the population density in the area under consideration;
- transport routes for hazardous substances;
- ease of evacuation or other measures which may need to be taken in the event of an accident; and
- existence of institutions nearby with vulnerable populations (for example, schools, hospitals, and homes for the aged).

C.4 Management of an enterprise should select possible sites for new hazardous installations which, in addition to being consistent with the guidance developed by public authorities, would minimise the adverse effects to health and the environment, including property, in the event of an accident at the installation or as a result of transport of hazardous substances to and from the installation.

C.5 Public authorities should ensure that the risks of an accident posed by a specific proposed development, including adverse effects in the event of an accident, are assessed taking into account

the full range of implications, advantages and disadvantages of the particular location. This should be done both for proposed hazardous installations and proposed developments of other kinds in the vicinity of hazardous installations.

- Quantified Risk Assessment (QRA), which is part of a systematic approach to the identification, estimation and evaluation of hazards, is one of a number of tools which can provide guidance to public authorities in land-use planning and be an aid to industry in decision-making. The use of standardised QRA procedures could facilitate the transparency of decision-making processes and allow for a relative ranking of risk. However, since the numeric results of QRA have little absolute value, QRA should not be used indiscriminately.

C.6 As part of the assessment process, management of an enterprise making a proposal to construct a new hazardous installation or a significant modification to an existing installation should be required to develop a scale plan of the proposed development showing:

- the locations and quantities of the hazardous substances present on-site relative to the surrounding area;
- the nature of the land-use in adjacent areas;
- the local population and areas of local environmental significance; and
- the potential off-site hazard effects posed by their proposal.

(i) Management should also provide details of the processes which will involve hazardous substances, the inventory of hazardous substances to be stored, and the conditions under which the hazardous substances are to be handled. Furthermore, management should provide an assessment of the environmental impact of the proposed installation.

(ii) These assessment-related activities should be carried out in conjunction with the local authorities as early as possible in the process of planning for the installation, in order to facilitate consideration of cost-effective alternatives.

C.7 Land-use planning decisions by public authorities related to hazardous installations should take into account the cumulative risk of all hazardous installations in the vicinity.

(i) Consideration should be given to avoiding intensification of the total risk to the community, recognising that in some cases it may be preferable to centralize hazardous installations in one location, while in other cases it may be preferable to keep hazardous installations apart.

(ii) Land-use planning decisions should take into account the possibility of a "domino effect" and the need for "separation distances" to provide a buffer zone between potentially hazardous areas and populated areas in order to reduce the risks of adverse effects in the event of an accident.

C.8 The availability of external emergency response capability should also be part of the land-use planning considerations.

C.9 Where a specific area with existing hazardous installations may not be able to meet current guidelines for land-use planning in the short-term, measures should be taken to alleviate the risks in the longer term, for example by modifying installations or by phasing out

older installations and/or residential buildings near the site. Such a phase-out may involve the need for compensation to property owners.

C.10 Land-use planning arrangements should include mechanisms for enforcement of zoning and siting decisions. The mechanisms for applying and enforcing land-use planning for safety purposes will vary from one country to another as a result of differing cultures, population, and legal systems, although some general principles can be identified.

C.11 The roles of public authorities with respect to setting of safety objectives for industry, and to land-use planning, should be well-integrated in order to minimise the adverse effects of an accident. Integrated land-use planning decisions can also help to reduce other environmental impacts such as those caused by chronic pollution and nuisance, as well as to address issues of transport risks.

C.12 The land-use planning activities of local, state/regional and national public authorities should be co-ordinated.

(i) State/regional and national authorities should develop the overall objectives to be met with supporting technical information and guidance.

(ii) Local authorities, at an appropriate level, are usually in the best position to make the planning decisions, taking into account local social and economic factors. Sufficient flexibility should be built into the process to allow social and economic factors to be taken into account in zoning and siting decisions.

C.13 The public should be given the opportunity to provide input into decision-making processes related to siting of hazardous installations (see OECD Council Decision-Recommendation C(88)85(Final), set out in Annex II).

C.14 With respect to land-use planning for proposed hazardous installations capable of causing transfrontier damage in the event of an accident, a policy concerning the exchange of information and consultation between competent public authorities of neighbouring countries should be applied consistent with OECD Council Decision C(88)84(Final), set out in Annex I.

Section D

Community Awareness

Provision of information to the public is addressed in this Section as a critical element in accident prevention and emergency preparedness and response programmes. The Guiding Principles set out in this Section are based on the fact that communication with the public is a joint responsibility of public authorities and industry.

D.1 Public authorities should ensure, through the legal and procedural means they deem appropriate, that the potentially affected public:

- **is provided with general information on the nature, extent and potential off-site effects on human health and/or the environment, including property, of possible major accidents at planned or existing hazardous installations;**

- **is provided with specific and timely information on the appropriate behaviour and safety measures they should adopt in the event of an accident involving hazardous substances; and**

- **has access to other available information needed to understand the nature of the possible effects of an accident (such as information on hazardous substances capable of causing serious off-site damage) and to be able to contribute effectively, as appropriate, to decisions concerning hazardous installations and the development of community emergency preparedness plans.**

(See OECD Council Decision-Recommendation C(88)85(Final), set out in Annex II.)

D.2 The activities of public authorities and industry related to communication with the public should be co-ordinated to optimise the value of the communication and to build up trust and credibility.

D.3 Information concerning the potential adverse effects of hazardous installations should be shared openly and actively and should be comprehensive, correct, credible, clear and consistent.

(i) Care should be taken not to underestimate the ability of the public to deal with information concerning hazardous installations, and not to be condescending in providing information to the public.

(ii) Public authorities should ensure that essential information is provided, and should not omit information out of a concern that it might generate fear or inquiries.

(iii) The public should be made aware of the information and documents available to them related to hazardous installations, and where these can be examined.

(iv) Highly technical documents should include meaningful and comprehensive summaries in language which is generally understandable.

(v) Public authorities should not infer a lack of interest on the part of the public if the public rarely consults such documents.

D.4 Public authorities should take steps to provide the public with information which will allow them to understand, and develop confidence in, the regulatory system's ability to ensure that hazardous installations are operating safely. Such communications should be two-way, providing an opportunity for public input to the authorities as well as providing information to the public from authorities. This will allow the public, public authorities and other interested parties to learn from each other.

D.5 Certain information concerning hazardous installations, for instance that related to emergency response, should be provided actively, without request, to members of the public potentially affected in the event of an accident (see OECD Council Decision-Recommendation C(88)85(Final), set out in Annex II). In defining the targeted audience for such information, natural community groupings or boundaries should be used to avoid disseminating different information among members of the same community.

D.6 The members of the public potentially affected by a major accident should be carefully delineated, and the information should be targeted so that all potentially affected people have adequate and appropriate information presented in an easily understandable manner.

- The information should permit all relevant individuals to understand their responsibilities (for example, teachers require special information and training in view of their responsibilities in the event of an accident and to assure parents that their children will be safeguarded).

D.7 In order to avoid confusion and facilitate information exchange, the mechanisms for obtaining and delivering information should be as clear as possible and use, to the extent possible, known and existing channels.

D.8 Information concerning hazardous installations which is provided to the potentially affected public should be provided in timely fashion, be reissued periodically, as appropriate, and updated as necessary.

D.9 The responsibility for communicating information concerning hazardous installations should be assigned to persons who have the necessary knowledge and skills, are viewed as knowledgeable and credible, instill confidence, and enjoy respect in the community.

D.10 Individuals responsible for communication of information related to hazardous installations should be specifically trained to understand how to develop information for target audiences and how to deliver information effectively, particularly in an emergency.

D.11 The effectiveness of communication with the public should be assessed to ensure that the information is understood and retained, in order that the appropriate actions are taken during an emergency. Consideration of the public's reaction to information concerning hazardous installations and accidents should be part of the testing and feedback stage of the communication process.

D.12 Mechanisms should be established to facilitate consultation with the public concerning the type of information it would like to receive and the information which should be made available regarding hazardous installations.

(i) Public authorities should initiate discussions with interested parties on the <u>acceptability/tolerability of risks</u> so that the public becomes familiar with <u>risk</u> concepts and is better able

to participate in the decision-making processes. Public authorities should consider the possibility of creating community groups for this purpose.

(ii) Industry can help promote this education process by maintaining close relations with the local population, community leaders and groups, education facilities, etc.

(iii) Non-governmental organisations may play a role in increasing public awareness by providing information concerning hazards and the need for safe practices, procedures and equipment.

D.13 Communication of information by industry to the public on plant safety, safety measures and the characteristics of substances should not be unduly hampered by reference to "trade secrets". As a general rule, multinational enterprises should not claim trade secret protection in one country for types of information they release in another country.

D.14 An effective internal communication system within a hazardous installation is a prerequisite for industry to achieve effective communication with the public. In addition, employees from hazardous installations can play an important role in communications with the public since they have a working knowledge of the installation and a strong incentive to ensure its continuing safe operation in order to protect themselves and their families.

D.15 As the media are a primary channel of information to the general public, media representatives should be involved in the development and implementation of the communication process. Industry and public authorities should provide representatives of the media with background information concerning hazardous installations, in order that the media can be more effective in providing information to the public.

Emergency Preparedness and Response

This Section deals with the roles and responsibilities of all parties in emergency preparedness and response. It also addresses, in subsection E.5, the related activities of reporting and investigating accidents and near-misses.

Paragraphs E.1.1-E.1.19 relate to both on-site and off-site emergency preparedness programmes and plans. Specific Principles relating only to on-site or only to off-site planning are set out in paragraphs E.1.20-E.1.29 and paragraphs E.1.30-E.1.41, respectively. These are followed in subsection E.2 with Principles relating to the communication process during emergency preparedness and response and, in subsection E.3, with medical aspects of emergency planning and response.

E.1 Emergency Preparedness Programmes and Plans

General Principles

E.1.1 Public authorities, at all levels, and management of hazardous installations should establish emergency preparedness programmes concerning accidents involving hazardous substances.

(i) The objective of emergency preparedness programmes should be to localise any accidents that may occur and, if possible, contain them, and to minimise the harmful effects of the accident on health and the environment, including property.

(ii) These programmes should include commonly accepted principles and practices.

(iii) The risk of transport accidents involving hazardous substances should be taken into consideration in emergency planning relating to hazardous installations.

E.1.2 Public authorities should develop guidelines and standards for off-site and on-site emergency preparedness plans. They should also ensure the development, implementation, testing and updating of off-site and on-site emergency preparedness plans in co-ordination with the management of hazardous installations and, as appropriate, with the participation of employees and of neighbouring communities, recognising that the responsibility for the actual development and implementation of the plans will differ among countries.

- The on-site and off-site emergency plans should give details of the technical and organisational procedures which are appropriate to reduce the effects on people, property and the environment both on-site and off-site in the event of an accident.

E.1.3 There must be close co-operation between those responsible for off-site and on-site emergency planning.

- The off-site emergency plan and all relevant on-site emergency plans must be consistent and integrated, so that, for example, there is effective co-ordination, problems with overlapping responsibilities and complicated interfaces are resolved, and it is clear who has the responsibility for various emergency response functions in the event of an

accident involving hazardous substances which may have off-site effects.

E.1.4 To form a basis for both off-site and on-site emergency planning, the management of a hazardous installation should identify and assess the full range of accidents, including low-probability, high-consequence accidents, which could arise at the installation. This information should be available in the safety reports, where such reports have been prepared (see paragraph B.2.13).

- Public authorities should give particular attention to ensuring that all hazardous installations, including small and medium-sized enterprises and commercial users of hazardous substances, undertake this assessment and the appropriate emergency planning. Specific assistance should be obtained, where necessary, to ensure that such enterprises and users fulfill their responsibilities in emergency planning.

E.1.5 Emergency planning should take into account potential complicating factors which could be associated with major accidents at hazardous installations such as extreme weather conditions, natural disasters, loss of power or water supplies, etc., as well as factors which may make response more difficult, such as problems with communication and transportation systems.

E.1.6 During the emergency planning process, there should be a realistic assessment of the capabilities and resources of those who will be involved in emergency response, and the skills and resources required. This assessment will provide insight into what additional skills and resources are needed.

(i) The planning process should also provide a learning experience concerning, for example, the potential for accident hazards based on: an analysis of a range of accident scenarios; possible implications of such accidents; response needs and capabilities; and the roles and responsibilities of those involved with emergency response.

(ii) Those parties who will be involved in emergency response should be involved in the planning process.

E.1.7 Emergency plans should provide the necessary guidance to allow for flexible response to a range of possible circumstances. An emergency plan cannot provide prescriptive instructions for response, since accidents by their nature will be different and will often involve a combination of aspects which may not have been considered during the planning process.

E.1.8 Back-up systems should be built into emergency plans. For example, alternative communication lines should be available, reliefs for key personnel should be assigned, and an alternative command centre should be designated in the event that the primary centre cannot function properly.

E.1.9 All responsible parties should ensure that manpower, equipment (including communication equipment and personal protective equipment), and financial and other resources necessary to carry out emergency plans are readily available for immediate activation in the event, or imminent threat, of an accident. Where necessary, expensive or specialised equipment should be obtained through joint co-operation at a regional level.

E.1.10 Provisions should be made for mutual assistance, in the event of an

accident, among neighbouring hazardous installations and public authorities.

E.1.11 Public authorities responsible for emergency response, including fire and rescue services, should familiarise themselves in advance of any emergency with the relevant information concerning a hazardous installation including the chemical and physical properties and the location of hazardous substances, as well as the location of water and foam supply points and other firefighting equipment at the hazardous installation.

(i) On-site managers should ensure that appropriate employees are familiar with the capabilities and response plans of the fire authorities and other emergency responders.

(ii) As part of the emergency planning process, emergency responders together with management should consider response options to various accident scenarios and should agree on appropriate options on a case-by-case basis.

E.1.12 All personnel involved in the emergency response process should be educated and trained on a continuing basis to ensure that a state of readiness for varying contingencies is maintained. Education and training programmes should be tested, assessed and revised regularly, as appropriate.

E.1.13 Exercises should be carried out on a regular basis to test both on-site and off-site emergency plans and their compatibility.

(i) The use of independent observers facilitates an objective review of any deficiencies or defects in the plans.

(ii) Exercises can test separately different components of a plan and can include simulations through, for example, table-top computer exercises.

(iii) Exercises should also be undertaken in adverse conditions (for example, outside normal working hours, during inclement weather, etc.) which stress the systems and, therefore, reveal the range of limitations and problems inherent in the systems.

(iv) The emergency plans should be revised as appropriate following evaluation of the exercises.

E.1.14 On-site and off-site emergency plans should be reviewed regularly and maintained up-to-date taking into account, for example, changes at hazardous installations and in the residential and commercial developments in the area, improvements in response technology and capabilities, and lessons learned in exercises and tests.

(i) The recording of the actions and decisions taken during an accident should be required so that the plans can be evaluated and lessons can be learned.

(ii) Following an accident, emergency preparedness plans should be reviewed in light of experience gained and, where appropriate, changes made.

E.1.15 Systems should be in place for the rapid detection of an accident or imminent threat of an accident, and for the immediate notification of emergency response personnel. The channel of communication should flow as directly as possible from the individual discovering the abnormal occurrence to the emergency responders.

E.1.16 Public authorities should consider whether to undertake emergency

planning for hazardous installations and emergency planning for natural disasters and civil defense in an integrated way, since these activities involve most of the same requirements.

E.1.17 Public authorities and management should consider what requirements may be needed to avoid pollution of nearby water sources, both surface and underground, in the event of an accident at hazardous installations.

E.1.18 The "Polluter-Pays Principle" with respect to emergency preparedness, as well as to emergency response, related to accidents involving hazardous substances should be applied, as appropriate, in accordance with OECD Council Recommendation C(89)88(Final), set out in Annex III.

E.1.19 Multinational and regional co-operative activities should be undertaken by public authorities in order to improve emergency preparedness planning and ensure appropriate co-ordination of emergency response in the event of an accident.

On-Site Emergency Preparedness Plans

The following ten paragraphs apply to on-site emergency plans, in addition to the General Principles set out above in paragraphs E.1.1-E.1.19.

E.1.20 All hazardous installations should have an adequate on-site emergency plan which is appropriate for that installation and is based on a complete range of credible accident scenarios.

(i) The preparation and implementation of this plan should be the responsibility of management, financed by the enterprise.

(ii) These plans should be subject to review by public authorities.

E.1.21 An on-site emergency plan should contain a scale plan of the site together with a list of all hazardous substances handled, indicating the quantities involved and their locations on the site relative to the surrounding area and population. The plan should also contain an evaluation of the hazards involved and include information regarding each hazardous substance, and the conditions under which the hazardous substance is processed, handled and stored.

E.1.22 Emergency plans should provide for the orderly and phased shutdown of an installation when necessary.

E.1.23 Information and equipment for generating data, which may be needed in the event of an accident, should be readily available. This would include, for example, analytical methods and equipment for detecting hazardous substances and the protective measures to be taken in the event of loss of containment of a hazardous substance. Models should be prepared for the most likely accident scenarios and their possible effects in order to facilitate rapid response.

E.1.24 In establishing the responsibilities for various employees in the event of an accident, the on-site emergency plan should take account of such matters as absences due to sickness, holidays and periods of installation shutdown, and should be flexible so as to be applicable to all foreseeable variations in staffing.

E.1.25 On-site emergency plans, in identifying the roles and responsibilities of all parties concerned, should clearly indicate: the chain of command and co-ordination among the parties; lines of communication; and the means of obtaining necessary information.

(i) As part of the emergency plan, individuals should be nominated for the following roles, among others:

- a site incident controller to take control on scene in the event of an emergency; and
- a site main controller to take overall control of an emergency from the emergency control centre.

(ii) The role of these controllers in relation to community emergency response personnel should be clearly spelled out in order to avoid any potential conflicts.

E.1.26 All employees and contractors at a hazardous installation should be made fully aware of the relevant provisions of the on-site emergency plan. In particular, they should be made aware of what to do in the event of an emergency such as taking action to limit the release of hazardous substances and/or evacuating the installation and gathering at a previously designated assembly point.

E.1.27 Visitors to a hazardous installation should be provided with relevant information concerning what they should do in the event of an emergency.

E.1.28 All employees should be informed of the procedures for raising the alarm in the event of an accident or threat of an accident to ensure that earliest possible action is taken to control an incident.

E.1.29 The organisation of activities related to emergency preparedness and those related to prevention of industrial accidents should be integrated with the normal operation of a hazardous installation, in order that the organisational structures for these activities are compatible.

Off-Site Emergency Preparedness Plans

The following twelve paragraphs apply to off-site emergency plans, in addition to the General Principles set out above in paragraphs E.1.1-E.1.19.

E.1.30 Public authorities should ensure that there is an adequate off-site emergency plan wherever there is a hazardous installation. Such a plan should:

- set out its objectives;
- provide relevant information on the hazardous installations and surrounding areas;
- evaluate the hazards (including transport hazards) which may result in emergency situations in the community; and
- establish the procedures to be followed, and identify the officials responsible, in the event of an accident.

E.1.31 Public authorities at various levels have responsibilities related to the off-site emergency planning.

(i) Central authorities should establish the general principles concerning such planning, provide advice and assistance, where appropriate, to local authorities and ensure that officials at all levels are motivated to develop appropriate emergency preparedness and response capabilities before an accident occurs.

(ii) Public authorities at the local level should ensure that off-site emergency plans are developed, consistent with the general principles.

(iii) The responsibility for the actual development and implementation of the off-site emergency plan may rest with local officials or with a designated committee, depending on the laws and policies which are applicable in the locality, and may include involvement by regional or national authorities. It should be clear, however, who has the decision-making responsibility for the development and implementation of the plan.

E.1.32 Management of a hazardous installation should provide, without reservation, information it has which is necessary to assess hazards and to develop the off-site emergency plan to those responsible for preparation of the off-site plan.

- In addition to information concerning the installation, management should co-operate with public authorities in the routing and identification of pipelines which carry hazardous substances outside the boundary fence of the hazardous installation across public land to another part of the site.

E.1.33 Highly technical and specialised information in emergency plans should be presented in a form appropriate for emergency responders. Technical details on a specific chemical should be expressed in terms which provide clear guidance as, for example, in the case of an acute exposure to a high dose.

E.1.34 In the development of an off-site emergency plan, all emergency response participants should be identified. In addition, their roles, resources and capabilities should be realistically established and their commitment and participation obtained. These participants should include, among others:

- police, fire, medical (including hospitals), transport and welfare services;
- emergency management or civil defense agencies;
- public works and utilities;
- the management of the hazardous installations;
- public information/communication outlets; and
- public health and environmental agencies.

E.1.35 Emergency preparedness plans, in identifying the roles and responsibilities of all the parties concerned, should clearly indicate the chain of command and co-ordination among the parties, the lines of communication and the means of obtaining the necessary technical, meteorological and medical information.

- The plan should identify an emergency co-ordinating officer with the necessary authority to mobilize and co-ordinate the emergency services.

E.1.36 Emergency planning must take into account the special situation of local institutions which may have particularly vulnerable populations such as schools, hospitals and homes for the elderly.

E.1.37 The emergency plan should provide guidance on when the potentially affected public should shelter indoors and when they should be evacuated.

E.1.38 The public should be given, on a continuing basis, specific information on the appropriate behaviour and safety measures they should adopt in the event of an accident involving hazardous substances (see OECD Council Decision-Recommendation

C(88)85(Final), set out in Annex II, and Section D of these Guiding Principles).

- The predictable reactions of the public should be taken into consideration when developing emergency response instructions. For example, the reactions of the public to stressful, unanticipated events are often determined by instincts rather than as a consequence of training and information and, therefore, parents will instinctively want to collect their children from school even if this will put them and their children at a greater risk of harm.

E.1.39 Procedures should exist for public input in the development of off-site plans (see OECD Council Decision-Recommendation C(88)85(Final), set out in Annex II).

E.1.40 For cases in which an accident at a hazardous installation may have effects in neighbouring communities, emergency planning and response should be co-ordinated among the potentially affected communities. Where an accident may have transfrontier effects, emergency planning and response should be carried out in co-operation with neighbouring countries. Careful planning is necessary to overcome differences between response systems and administrative cultures in the countries concerned (see OECD Council Decision C(88)84(Final), set out in Annex I).

E.1.41 An up-to-date national network of experts on emergency preparedness and response should be maintained. In addition, there should be an international listing of groups of experts who can make themselves available to countries requiring assistance in the event of an emergency. The *International Directory of Emergency Response Centres*, which has been jointly published by the OECD and UNEP, forms a good basis for such a listing.

E.2 Communications

E.2.1 Emergency warning alert systems should be available to warn the potentially affected public that an accident has occurred or that there is an imminent threat of an accident.

(i) The system chosen can vary depending on local culture and conditions providing that it is effective and timely. Suitable warning systems could include, for example, sirens, automatic telephone messages, mobile public address systems or a combination of systems.

(ii) The potentially affected public should be notified of the systems which will be used in an emergency, and the systems should be tested in advance so that their significance is fully understood by the public and the public knows how to respond appropriately in an emergency.

(iii) In order to increase public understanding of warning systems, new approaches - such as public education through schools and greater use of audio-visual materials - should be explored.

E.2.2 Designated spokespeople for emergency situations should be carefully chosen in order that they have the necessary knowledge, skills, authority and credibility to effectively communicate with the public.

(i) They should be specifically selected and trained to understand how to develop information for target audiences and deliver information effectively.

(ii) Since effective communication with the public during an emergency requires the co-ordinated involvement of a number of relevant parties - including, for example, local response officials, corporate spokespeople, employee representatives, community representatives, public authorities, technical experts and the media - the duties of these parties should be established during the preparation of emergency plans.

E.2.3 The media should be involved during the development of emergency plans and should be given information concerning the emergency plans in order that they have the necessary background to be an effective and reliable source of information should an accident occur.

E.3 Medical Aspects of Emergency Preparedness and Response

The subject of medical aspects of emergency preparedness and response is being addressed in greater detail through a joint activity of the International Programme on Chemical Safety, the World Health Organization (Euro), the United Nations Environment Programme and the OECD. A Workshop to consider guidelines in this area will be held in mid-1993. The Guiding Principles in this subsection are, therefore, provisional and will be reviewed and substantially augmented by the guidelines resulting from the Workshop.

E.3.1 Public health authorities should establish their own health sector plans at national, regional and local level as part of the overall emergency preparedness plans.

(i) Each country should establish an information centre capable of providing relevant information in an emergency on the diagnosis, treatment and rehabilitation of persons injured by chemicals.

(ii) This information should be available on a 24-hour-a-day basis throughout the year.

E.3.2 Public health authorities, including experts from the information centre, should be involved in national and local emergency planning related to accidents involving hazardous substances.

(i) They should take part in exercises with the other relevant authorities involved in emergency response, in order to test emergency plans and train emergency response medical staff.

(ii) They should be consulted when issuing statements to the media concerning health aspects of chemical accidents.

E.3.3 As part of emergency planning, it should be ensured that adequate medical facilities are available including transportation facilities, which may mean in an emergency the rapid transformation of facilities normally used for other purposes.

(i) The availability should also be ensured of up-to-date antidotes and other pharmaceutical substances, including oxygen, necessary for the treatment of persons injured by chemicals.

(ii) Where suitable antidotes exist for treatment of persons injured by chemicals produced or used by industry, the industry should be required to ensure their availability locally if this is a problem for the health authorities. Necessary relevant emergency medicines, kept updated, should be available at

installations handling toxic chemicals.

(iii) Decontamination equipment for on-site and hospital use and, as appropriate, protective equipment for the medical emergency response personnel should also be available.

E.3.4 Public health and education authorities should ensure the basic training of all medical and paramedical professions, as appropriate, in the principles of medical toxicology and emergency medicine. Specialist courses should be provided for those involved in emergency response work.

E.3.5 Industry should be encouraged to provide to the appropriate information centres adequate data for emergency medical response and follow-up, including information on the composition and the toxicological and other relevant properties of chemical products which they produce, use, store, dispose of, or transport. Arrangements should be made to guarantee the confidentiality of data, where appropriate.

E.3.6 Research into new antidotes and decontamination procedures for toxic chemicals should be encouraged by the health authorities and the relevant sectors of industry.

E.4 Emergency Response

E.4.1 Management of a hazardous installation should promptly notify emergency response authorities of all incidents involving hazardous substances which result or threaten to result in potential harm to health or the environment.

(i) Notification should flow as directly as possible from the individual detecting the incident to responders.

(ii) The initial notification should include the following information, if ascertainable:

- the nature of the incident;
- the hazardous substances involved;
- the potential severity of the incident; and
- the incident's potential off-site effects.

E.4.2 The notification from the hazardous installation should trigger the implementation of the off-site emergency response plan, beginning with an initial assessment of the situation leading to a decision on which response actions are required.

E.4.3 Handover of responsibility from management to public authorities, in the case of accidents with potential off-site effects, should be based on criteria contained in the emergency plan. These criteria should make it clear at what stage the handover should take place, and to whom.

E.4.4 The first responders to an accident should have sufficient information, training and experience to be able to assess quickly whether they can deal with the situation, or whether additional equipment and/or persons with particular expertise should be summoned. Mechanisms should be in place for the first responders to obtain whatever additional personnel and equipment are needed for responding to the accident.

(i) Systems should be available to allow immediate, on-the-spot access to the information necessary to assess and respond to an emergency and, in particular, information regarding: all hazardous substances in the installation; how to deal with these substances and their effects; and, as

appropriate, related transport activities.

(ii) Systems should be in place for obtaining assistance, as needed, from emergency responders in neighbouring or other appropriate communities.

E.4.5 Where the safety of the first emergency responders is at risk, or where other difficulties exist in responding effectively, specialists should be called in to assist with such matters as:

- identification of the hazardous substances involved;
- evaluation of the hazard;
- need for protective equipment;
- control and containment of the hazardous substances; and
- decontamination and emergency termination activities.

Such specialists should be able to provide fast, reliable information under stressful conditions so that it can be understood and immediately acted upon by emergency services personnel.

E.4.6 In the case of the release of a toxic substance, the decision on whether the potentially affected public should shelter indoors or be evacuated should be taken by the responsible person designated in the emergency preparedness plan. The decision made should be based on likely exposure and possible health effects.

E.4.7 The systems used for communicating with the public in an emergency to provide initial and continuing information should be well-known and readily accessible and understood.

E.4.8 The media should have ready and continuous access to designated officials with relevant information, as well as to other sources, in order to provide essential and accurate information to the public throughout the emergency and to help avoid confusion. Efforts should be made to check the clarity of the information as it becomes available, before it is communicated to the public.

E.4.9 Official spokespeople should be as open as possible in providing information during an emergency. In this regard they should, for example, admit when information is not available, avoid making promises which cannot be fulfilled, be the first to give bad news, and ensure that the messages provided are consistent with actions taken.

E.4.10 Public authorities should ensure that systems are in place to provide information to the public following the accident and the immediate emergency response.

(i) Such information should cover the off-site effects of the accident, the risks of further adverse off-site effects, and related follow-up information.

(ii) Counselling services should be made available for victims of the accident as well as victims' family, friends and fellow employees.

E.4.11 During the transition between emergency response/rescue operations and clean-up activities, all those involved should co-operate and exchange information in order to maintain safety and protect and/or restore the environment.

E.5 Incident Reporting and Investigation

General Principle

E.5.1 Efficient reporting and investigation of all significant incidents should be undertaken by industry and public authorities, as they can provide an important contribution to the safe operation of hazardous installations. Incident reporting and investigation can also help to instill public confidence that proper actions will be taken to avoid similar incidents, or incidents with similar consequences, in the future.

(i) Reporting and investigation should identify causes of incidents and lead to remedial action to correct any deficiencies in technology or procedures which led to the incident.

(ii) All interested parties should encourage, and management should promote, the full reporting and critical examination of accidents and near-misses.

Reporting

E.5.2 All fatalities, regardless of cause, all significant incidents, and other "reportable" events as determined within the enterprise, should be immediately reported by local management to the appropriate members of management of the enterprise.

- Reportable events should include those which occur in conjunction with work by contractors.

E.5.3 Employees and contractors should be positively encouraged by their management to report all incidents to appropriate managers in the enterprise so that the causes can be established.

(i) Employees should be given the appropriate training in hazard identification to facilitate this.

(ii) Employees should also be encouraged to discuss near-misses among themselves immediately after they happen.

(iii) Efforts should be made to foster an environment where reporting incidents and discussing them are considered to be positive activities.

(iv) Employees should be given the assurance that there will be no adverse repercussions for reporting incidents to management or discussing incidents among themselves.

E.5.4 Public authorities should require prompt notification to an appropriate authority of the key elements of major accidents involving hazardous substances. This notification should be followed up by formal written reports.

(i) Public authorities should encourage the voluntary reporting by enterprises to public authorities of accidents and significant near-misses beyond that legally required.

(ii) Similar information on incidents should be provided to relevant trade associations.

E.5.5 Mechanisms to foster the open and frank exchange of information related to accidents and near-misses, both within an enterprise and among enterprises, should be further developed and encouraged. There is an obvious need to capture and share such information widely throughout industry, so that enterprises can learn from the experience of others.

- In addition to the sharing of information within industry, means should be developed to involve public

authorities in this information sharing without jeopardising the enterprises' interests.

E.5.6 Public authorities and industry should promote further efforts to improve the international exchange of information on significant accidents and near-misses in order to promote safety.

- Efforts should be made to co-ordinate reporting by industry at the national and international level, in order to facilitate information sharing.

E.5.7 Public authorities should also establish a structured national system for maintaining statistics on accidents involving hazardous substances. This will facilitate: exchange of information; analyses of this information; and dissemination of the results of the analyses.

Investigation

E.5.8 The local management of an installation should be responsible for ensuring the prompt investigation and thorough analysis of all incidents.

(i) The emphasis should be on identifying the underlying causes, the lessons to be learned, and ways to prevent future accidents rather than identifying the person(s) responsible.

(ii) The use of a computer database for storing the key elements of incidents can facilitate their analysis. By this means, particular trends can be highlighted and historical data can be used proactively in accident prevention, for example by orienting safety training towards the avoidance of the type of incidents which have occurred.

E.5.9 Public authorities should independently investigate all major accidents.

(i) Where appropriate, this investigation should be conducted by a group of experts (for example, a specially designated commission) which includes different individuals than those responsible for inspection of installations and enforcement of the control framework.

(ii) All appropriate interested parties should have an opportunity to be involved in this investigation.

E.5.10 In all accident investigations, efforts should be made to determine the underlying cause(s) in a chain of events leading to an accident, and not to limit the investigation to determining the apparent cause(s).

- Where "human error" is involved, the cause should not simply be so recorded. Rather, investigators should determine exactly what elements contributed to any human error. Such elements could include boredom, stress, overwork, lack of training, inadequate procedures, poor ergonomic design, poor system/technology design, communication problems, management inadequacies, inappropriate safety goals, and similar factors.

E.5.11 Public authorities should publish accident investigation information for as wide dissemination as possible. This should include sufficient information to enable it to be useful in other situations, as well as any conclusions arising from the analysis of accident data.

- Public authorities are in a unique position to correlate information, foster exchange of information, and

provide credible analyses. Such information is important in order to gain knowledge useful for public authorities and management in their role in evaluating and making decisions related to, for example, regulation, monitoring, preparation of emergency plans, and development of risk assessment and management techniques.

Section F

Research and Development

This Section concerns research and development related to improving safety at hazardous installations and reducing adverse effects in the event of an accident. As described below, research and development should be a co-operative activity involving industry, public authorities, academia and intergovernmental organisations.

F.1 The primary responsibility for carrying out such research rests with industry, that is the manufacturers and processors of hazardous substances as well as equipment designers.

- Public authorities should promote research and development by industry.

F.2 Industry should fund the research and development needed to permit the most effective compliance with regulations and other requirements.

F.3 Public authorities should finance research and development related to policy formulation and implementation, and in support of their statutory duties.

(i) Public authorities should also consider financing the following:

- research which industry would not normally undertake because, for example, it involves bringing together analytical skills not necessarily available in one enterprise or sector of industry; and

- research related to the sociological and psychological aspects of accidents, such as the ways organisations and people behave during emergencies.

(ii) Public funds should be allocated to those projects which have the greatest potential for improving safety.

F.4 In order to make greater use of the results of the significant amount of safety-related research which already exists, public authorities and industry should promote applied research incorporating these results while continuing efforts to refine them. In addition, special efforts should be made to obtain appropriate experimental data in order to validate the models used in accident analysis.

F.5 Co-operation among research groups should be encouraged through multi-member, shared-cost research projects and informal networks, as well as through exchange of information at meetings and in written materials. Such co-operation helps to establish trust and confidence in the work of others and to avoid unnecessary duplication.

F.6 A significant amount of safety-related research results are disseminated in the form of computer software. Their evaluation should be subject to peer review in the same way as research results disseminated in scientific journals.

F.7 The results of safety-related research should be disseminated as widely as possible. Therefore, these results should be available in an acceptable format and in a language which could be widely understood by potential users.

- In order to promote the widest use of research results, activities should be initiated to develop common

terminology at the international level through professional associations and other means.

F.8 National and international inventories of research activities should be established in order to facilitate the dissemination of research information and results, including research financed by industry, public authorities and academia. There should be rapid exchange of information on planned and on-going research and research results, so as to stimulate the appropriate use of scarce resources and minimise unnecessary duplication.

F.9 Special attention should be given to how research results should be disseminated to those potential users who may not have regular access to existing channels of information. For example, efforts should be made to target research results related to safety technology and management processes to small and medium-sized enterprises. In addition, information of interest to public authorities should be disseminated, as appropriate, to local communities and to public authorities in non-OECD countries.

F.10 The curriculum and research programmes of science and engineering departments of universities and colleges should include, as an integrated element, safety aspects of design, operation and management of hazardous installations and the transport of hazardous substances. These issues should also be incorporated in the relevant activities of professional organisations.

Section G

Transfer of Technology and International Investment Related to Installations in Non-OECD Countries

The premise of this Section is that hazardous installations in non-OECD countries should meet a level of safety equivalent to that of similar installations in OECD countries. In this regard, it should be emphasized that the foregoing Guiding Principles should apply to all hazardous installations irrespective of location. This Section highlights certain points and sets out additional Principles which should be taken into account in order to achieve this equivalent level of safety when OECD-based enterprises transfer technology to, or invest in, hazardous installations in non-OECD countries. It should be pointed out that general Principles related to transfer of technology and to acquisitions and affiliated operations are set out in paragraphs B.4.18-B.4.22 and B.4.23-B.4.30, respectively.

This Section is not meant to be comprehensive in indicating how the Principles set out in previous Sections may need to be elaborated in order to take into account situations in which technology or investment flow from an OECD country to a non-OECD country. Rather, it is meant to illustrate the types of local requirements, circumstances and cultural aspects which should be considered, as well as the need in some cases to redefine the roles and responsibilities of public authorities, industry and employees in order that the overall objective of an equivalent level of safety is achieved.

Section G relates to the roles and responsibilities of public authorities, industry and employees (and employee representatives where they exist) in the OECD countries from which the technology or investment originates. Clearly the public authorities, industry and employees (and their representatives where they exist) in the non-OECD, recipient countries also have critical roles and responsibilities related to the safety of hazardous installations, and it is ultimately the responsibility of the host government to establish and enforce appropriate safety objectives. Since these Guiding Principles have been developed within the OECD, however, it was considered appropriate to limit this Section to the provision of guidance only to parties from OECD countries, with the recognition that Guiding Principles relating to the roles and responsibilities of recipient countries should be developed in a forum in which the views of representatives of non-OECD countries would be represented. Nevertheless, it should be recognised that these Guiding Principles, in general, have been drafted so as to apply in all countries including non-OECD countries, and it is therefore hoped that they will be utilised world-wide.

A basic premise of these Principles is that there should not be any discrimination in treatment between domestic and foreign enterprises, and that these Principles should be implemented in a non-discriminatory fashion: the same standards should apply to domestic technology and investments as to imported technology and foreign investments. In this regard, the provisions of the General Agreement on Tariffs and Trade (GATT) should be followed.

In addition, the Environment chapter in the Revised OECD Guidelines for Multinational Enterprises, set out in Annex IV, should be taken into account.

Consideration was given as to whether this Section of the Guiding Principles should incorporate a type of "prior informed consent" procedure for particularly hazardous technologies, paralleling the activities for banned or severely restricted chemicals. It was concluded that, while the objective of such a procedure is appropriate, technology cannot be classified as banned or severely restricted. Furthermore, such a procedure would appear unnecessary given the general provision of G.1.1. indicating that the degree of safety of the technology being transferred should be the highest level of safety reasonably practicable. A number of provisions in this Section do, in addition, call for the exchange of the types of information associated with prior informed consent procedures.

G.1 General Principles

G.1.1 The degree of safety of installations which result from an investment by an OECD-based enterprise, or which incorporate process or other safety-related technology transferred from an OECD country, should be the highest level of safety reasonably practicable according to the current state of knowledge and local circumstances. All parties should promote a level of safety for hazardous installations in non-OECD countries equivalent to that for similar installations in Member countries. Equivalent level of safety does not preclude the public authorities or enterprises from seeking to achieve a higher level of safety.

(i) Good design, engineering, construction, operational procedures and management practices should be followed at the installation in order that safety is maintained on a continuing basis. Account should also be taken of the need for education and training, as well as the need for provision of information concerning the installation.

(ii) The transfer of technology, or the investment, should only take place once there is reasonable assurance that safe operating conditions can be achieved.

(iii) Responsibilities, including costs, associated with meeting the objectives of these Guiding Principles may be allocated by agreement amongst the parties concerned.

G.1.2 When an OECD-based enterprise invests in a new hazardous installation in a non-OECD country, or provides process or other safety-related technology for such an installation, the process should be chosen and the installation should be designed to take into account local factors which may affect the safety of the installation. These include, among other considerations:

- geographical and climatic conditions;
- cultural and socio-economic factors;
- infrastructure, including emergency services;
- legal and administrative framework;
- land-use policies;
- local legal and control systems;
- local availability of labour;
- information systems; and
- available construction materials and equipment.

G.1.3 Technology suppliers and investors should, in conjunction with technology receivers and relevant public authorities, prepare a site-specific hazard assessment that includes, among other things, an

evaluation of the culture and practices in the non-OECD country that may prompt a re-design of the safety engineering system, and an evaluation of the potential impacts of any design assumptions that may affect the safe use of the technology at the specific location. These might include, for example, assumptions regarding the capacity and size of existing public emergency services, the reliability of steady electrical supply, the size of the pool of safety engineers, and the availability of spare parts and maintenance equipment.

- The hazard assessment should be used in deciding whether to go forward with a proposed technology transfer or investment.

G.1.4 The Guiding Principles relating to provision of information to employees and to the public should be applicable to all hazardous installations, irrespective of location, recognising however that the location of the installation may affect the relative roles of industry and public authorities. For instance, if local public authorities do not have adequate resources to implement public information schemes, the management of a hazardous installation should undertake to make relevant information available to the public, consistent with Section D of these Guiding Principles.

- The approaches used for risk communication in OECD countries cannot effectively be transferred wholesale to non-OECD countries. To ensure that the information provided is accurate, comprehensive and understood, the approaches used in non-OECD countries should take into account such differences as social and family structures, religious influences, language/dialect differences, resource limitations, and available information dissemination technology.

G.1.5 International organisations should continue to take action to support the principle that transfers of technology and investments concerning hazardous installations should only take place when accompanied by the related safety technology and "know-how", together with the assurance that safe operating conditions can be achieved in the recipient country.

G.2 Transfer of Technology: Role of Technology Suppliers

Subsections G.2 and G.3 concern the transfer of process or other safety-related technology by an OECD-based enterprise to a hazardous installation in a non-OECD country. The transfer of technology could be either: between independent parties; or within the framework of a relationship between companies. In the latter case, the relationship can range from minority participation to full ownership. The nature of this relationship may affect the allocation of responsibilities between the technology supplier and receiver, or may influence the means of carrying out their respective responsibilities.

These Guiding Principles should be read in conjunction with the general Principles on Transfer of Technology (paragraphs B.4.18-B.4.22).

G.2.1 The responsibilities of all parties involved in the transfer of technology related to a hazardous installation should be clearly defined at a preliminary stage of the transaction. There should be a written contract between the supplier and the receiver which specifies the duties of each with respect to the safety aspects of the technology being transferred, recognising that responsibility is linked to effective operational control. Such arrangements should take into account the amount of resources needed to

comply with safety requirements, as well as the corporate Safety Policy and guidelines.

G.2.2 The technology supplier should export only those technologies for which sufficient experience has been gained to permit an appropriate hazard analysis of the safety of the technology at the location where it will be used.

G.2.3 Transfer of technology related to hazardous installations should only take place if accompanied by the appropriate safety technology and the information necessary for the safe operation of the installation.

G.2.4 Consistent with the principle that technology transfer should only take place when accompanied by related safety information, the technology supplier should make available to the technology receiver and, on request, to competent public authorities in the importing country, the following information relating to the technology to the extent relevant to safety:

- national regulations, legal or administrative requirements, and accident prevention practices in the major areas where the technology is in use;
- generally accepted safety standards, voluntary codes, trade association rules, and other technical guidance documents relevant to the technology design, construction or operation;
- description of the process, including all necessary data on the substances handled, the chemical reactions involved, etc.;
- operating instructions and critical operating parameters during routine and non-routine conditions;
- a hazard analysis indicating, among other things, significantly hazardous features of the technology, known or suspected safety problems associated with the technology, possible products of runaways and domino effects during an accident, the minimum and maximum safe operating zones for each industrial process, and the normal quantities of hazardous, toxic and flammable substances present during processing or storage;
- any additional information relevant for hazard assessment and control, for the safe operation of the technology and the safe handling of any hazardous substances used or manufactured, and for review of safety performance;
- directions for maintenance, including the recommended frequency of surveillance and of maintenance of vital components as well as the installation as a whole, estimates of the prospective maintenance costs, monitoring equipment needed, and the skills required; and
- manuals and programmes for the education and training of employees.

(i) The above information should be available in an appropriate language and should be provided as early as possible and, to the extent appropriate and in accordance with the contract, before the transfer of technology takes place. The schedule for the provision of information should be acknowledged in the negotiation process for the transfer.

(ii) Recognising that this paragraph applies to the provision of information to the extent necessary to ensure safety, appropriate arrangements should be in place to

ensure the protection of legitimate trade secrets, taking into account paragraph D.13. The above in no way diminishes the intellectual property rights associated with the product or process which is the subject of the transfer of technology.

G.2.5 The technology supplier should indicate to the technology receiver and, as appropriate, to the public authorities in the technology importing country, if the technology being transferred involves activities which are classified as hazardous in the supplier's country and/or, if known, in any third country.

G.2.6 The technology supplier should be responsible for safe process design, supervision of commissioning, initial technical education and training, and start-up assistance, and for providing information needed for safe operation and safe handling of products used or manufactured, recognising that there should be a contract specifying the duties of the supplier and receiver in accordance with paragraph G.2.1.

G.2.7 The technology supplier, through its own staff or consultancy services, should make technically qualified people available to provide assistance to the technology receiving enterprise for training and education regarding the safety of the technology, including the adaptation of the transferred technology to local conditions and its implementation in the local industrial infrastructure. Such assistance should be made available during the design, construction, start-up and initial operation of the hazardous installation (see paragraph G.2.1).

(i) Normally, the technology receiver should be responsible for detailed engineering, plant construction, process operation, plant maintenance and modifications, alteration in design or operating procedures, provision of information to local authorities on safety issues, training and supervision of the workforce, and the establishment of safety and security checking systems.

(ii) Specific contractual provisions can require the technology supplier to exercise control over some of these tasks.

G.2.8 The technology supplier should, as appropriate, continue to provide information and assistance necessary for the safe operation of a hazardous installation following start-up, although the extent of this responsibility and the period during which it applies can vary depending on the type and context of the specific contract. In all cases, the technology supplier should provide any relevant subsequent information related to safety which was not identified at the time of the transfer including, for example, information concerning the investigation of an accident or near-miss involving related technology (see paragraph G.2.1).

G.3 Transfer of Technology: Role of Technology Exporting Countries

G.3.1 Upon request by public authorities in the technology importing country, the public authorities in the technology exporting country should make available, to the extent reasonably practicable, the following information concerning a proposed or actual transfer of technology related to a hazardous installation:

- national and local legal and administrative requirements and regulations applicable to the situation in which the installation is sited and operated;

- government-prepared information relevant to the risks and safe operation of the technology being transferred and the purpose for which it is intended to be used; and

- publicly available post-accident and incident-review studies and reports, to the extent relevant.

(i) Public authorities in the technology exporting country should be able to recover the costs of providing this information from the technology supplier, as appropriate.

(ii) Efforts should be made to develop an international mechanism for the collection, collation and dissemination of this type of information on a worldwide basis.

G.4 Investments by OECD-Based Enterprises in Hazardous Installations in Non-OECD Countries

Subsection G.4 relates to international investment by an OECD-based enterprise in a hazardous installation in a non-OECD country. This can involve a wide range of activities, including those in which the hazardous installation is under the actual control of the OECD-based enterprise (defined as a subsidiary relationship) and those in which the OECD-based enterprise is a minority partner and does not have actual control of the installation through contractual or other means (defined as an affiliate relationship). The nature of the investment could be, for example, an acquisition of an existing installation, the construction of a new installation, or participation in a joint venture partnership.

It should be noted that many of the provisions relating to the transfer of technology also apply to investments. Often the investment requires a transfer of technology, or a technology transfer is needed to bring the installation in issue up to the necessary degree of safety.

These Guiding Principles should be read in conjunction with the general Principles on Acquisition and Affiliated Operations (paragraphs B.4.23-B.4.30).

G.4.1 The prevention of accidents should be one of the fundamental business considerations taken into account by OECD-based enterprises, as well as by international service organisations and financial institutions, in any investment related to a hazardous installation in a non-OECD country. The amount of resources needed to comply with safety requirements as well as corporate safety policies and safety practices, based on these Guiding Principles, as well as the influence of local needs and culture, should be taken into account in determining the levels of funding and assistance required in conjunction with the investment.

G.4.2 Investments by OECD-based enterprises resulting in new enterprises should be accompanied by good design, engineering, construction and operational practices in order that a high degree of safety can be maintained on a continuing basis. Account should be taken of the needs for education and training, as well as for the transfer of information, concerning the installation and its operation in the local community.

G.4.3 To the extent reasonably practicable, an OECD-based enterprise should ensure that subsidiaries apply policies and practices concerning accident prevention and emergency preparedness and response which are equivalent to those followed by the enterprise in the home country. Equivalent does not preclude the public

authorities or enterprises from seeking to achieve a higher level of safety.

(i) The means of implementing these policies and practices should be adapted to the particular local needs and circumstances, including legal, policy, administrative, technical and similar factors.

(ii) Line management of individual installations should develop its own safety programmes to implement the enterprise's Safety Policy;

(iii) Information concerning the hazardous installations and measures to adopt in the event of an emergency should be provided to employees, contractors and the local community in a manner equivalent to that done by the enterprise in its home country; and

(iv) Employees should have rights concerning participation in safety-related activities at the hazardous installation equivalent to those of employees in the home country.

G.4.4 The corporate Safety Policy of an OECD-based enterprise should be publicised in the relevant national language(s) in all hazardous installations of subsidiaries and, to the extent possible, in hazardous installations of affiliates.

G.4.5 An OECD-based enterprise should endeavour to have affiliates adopt safety policies and practices which are comparable to its own, and should offer assistance to facilitate this objective.

G.4.6 An OECD-based enterprise with investments in hazardous installations in non-OECD countries should co-operate with local officials to ensure that an appropriate infrastructure exists for emergency preparedness and response, siting/land-use planning, and provision of information to the public.

G.4.7 Safety experience including, among other things, experience relating to operation, training, maintenance, emergency preparedness and response gained by an OECD-based enterprise operating in a non-OECD country should be shared among local enterprises within that country, while recognising the need to protect trade secrets.

G.4.8 International service organisations, particularly engineering firms, law partnerships, consultancy firms, financial institutions and financial advisors, should take reasonable steps to ensure that their practices encourage the application of these Guiding Principles by, for example, following the relevant Principles in their own activities and by bringing the Principles to the attention of the appropriate corporate or government clients.

Section H

Bilateral and Multilateral Technical and Financial Assistance

This Section deals with the provision of technical and financial assistance from OECD countries, and from multilateral aid agencies and multilateral financial institutions. It recognises that significant experience related to accident prevention, preparedness and response is available in OECD countries and that means should be found to facilitate transfer of information and know-how to those countries which may not have the same level of knowledge or experience.

This Section also incorporates the idea that assistance to non-OECD countries should be consistent with ecologically sound development and, therefore, efforts should be made to minimise the possibility that assistance projects will help create, increase or sustain risks of accidents involving hazardous substances. In this regard, assistance related to the safety of hazardous installations should be linked with assistance provided for infrastructure development related to environmental protection, as well as with assistance for industrial development.

H.1 Aid Agencies

H.1.1 Bilateral and multilateral aid agencies should help non-OECD countries to minimise the risk of accidents involving hazardous substances through development assistance projects. Technical assistance and training should be provided to build institutional infrastructures and to further develop human resource capabilities.

H.1.2 Aid agencies should screen relevant aid proposals to minimise the possibility that projects will help create, increase or sustain an unreasonable risk of an accident involving hazardous substances, and to further the objective that hazardous installations in non-OECD countries should meet an equivalent level of safety to similar installations in OECD countries.

- Aid agencies responsible for initiating bilateral aid proposals should be sensitive to issues of safety with respect to such proposals.

H.1.3 Technical co-operation between OECD and non-OECD countries should be strengthened in order to increase the institutional capability of non-OECD governments to fulfill the roles and responsibilities of public authorities related to the safety of hazardous installations. This should include, for example, assistance relating to establishing accident prevention programmes, undertaking emergency planning, responding to an accident, and facilitating assistance should an accident occur.

H.1.4 Aid agencies should provide information, technical education, training and assistance to promote safety of hazardous installations at the local level through, for example, siting and land-use policies to avoid the encroachment of populations in the vicinity of hazardous installations, and the application of the UNEP APELL procedures, the ILO Code

of Practice on Prevention of Major Industrial Accidents, and related guidance materials.

- Intergovernmental organisations, as well as industry and trade unions and their international organisations, should assist with such technical co-operation.

H.1.5 Aid agencies, industry associations and enterprises in OECD countries should assist non-OECD countries to identify appropriate technical and financial support for activities related to accident prevention, preparedness and response.

H.1.6 The team within an aid agency responsible for developing aid proposals should, as appropriate, include specialists with the background, training and experience necessary to consider the potential safety consequences of any proposals relating to hazardous installations.

H.1.7 Aid agencies should use formal and explicit procedures to assess potential risks of accidents when decisions are being taken concerning technical and financial assistance in connection with specific hazardous installations.

H.1.8 Aid agencies should ensure that an adequate assessment of accident potential, consistant with these Guiding Principles, is carried out prior to providing financial assistance to support new hazardous installations or the expansion of existing installations. This assessment should take into account, among other things: potential technical failures; management capability; workforce capability; appropriateness of the technology for the local community; and the institutional arrangements for oversight, emergency preparedness and response.

(i) In this regard, environmental impact assessments should include consideration of the risk of accidents involving hazardous substances.

(ii) The results of these assessments should be made available to officials in the aid-recipient countries and to local community groups.

H.1.9 Input should be sought from local residents in the aid-recipient country, including community leaders, in undertaking the formulation, assessment and implementation of aid projects relating to hazardous installations, in order to benefit from their knowledge about the special attributes and limitations of the local community (infrastructure, workforce capability, cultural considerations, etc.).

H.1.10 Funding allocations from aid agencies related to hazardous installations should ensure that sufficient resources are available for safety-related issues such as education and training. Consideration also should be given to incorporating arrangements and funding for adequate monitoring, evaluation, maintenance and other follow-up to ensure that essential safety requirements are being met.

H.1.11 Aid agencies should ensure the availability of emergency medical facilities, and of information necessary for treatment of injured persons, where they are financing industrial and other development projects involving toxic chemicals. Such agencies should be encouraged to finance the development of the capability in non-OECD countries for adequate medical response to accidents involving hazardous substances.

H.2 Multilateral Financial Institutions

H.2.1 Multilateral financial institutions should develop and apply policies and procedures for minimising the risk of accidents at hazardous installations that they help to finance. For example, they should not assist with any project which poses an unacceptable risk of a major accident involving hazardous substances.

(i) In this regard, an adequate assessment of accident potential, consistent with these Guiding Principles, should be carried out prior to the multilateral financial institutions providing financing for new hazardous installations or expansion of existing installations.

(ii) In addition, these institutions should assist non-OECD countries, as appropriate, to undertake an analysis of risks of existing installations and help develop education and training programmes concerning accident prevention, preparedness and response.

H.2.2 Multilateral financial institutions should inform host governments when projects they propose to help finance would create, increase or sustain a risk of a major accident involving hazardous substances, and should provide any available information concerning these risks.

H.2.3 Multilateral financial institutions should promote appropriate safety practices by enterprises which are to receive financial credits for transfer of technology with the potential for a major accident by actively encouraging such enterprises to follow these Guiding Principles, and by taking into account the resources necessary to do so in determining the level of their financial assistance.

Acronyms

APELL:	Awareness and Preparedness for Emergencies at Local Level (UN Environment Programme)
BIAC:	Business and Industry Advisory Committee to OECD
CAER:	Community Awareness and Emergency Response
CCPA:	Canadian Chemical Producers Association
CCPS:	Center for Chemical Process Safety (of the American Institute of Chemical Engineers, AIChE)
CEFIC:	Conseil Européen des Fédérations de l'Industrie Chimique (European Chemical Industry Council)
CIA:	(UK) Chemical Industries Association
CMA:	(US) Chemical Manufacturers Association
CONCAWE:	The Oil Companies European Organization for Environmental and Health Protection
EFCE:	European Federation of Chemical Engineering
EPA:	(US) Environmental Protection Agency
HSE:	(UK) Health and Safety Executive
IAEA:	International Atomic Energy Agency
ICFTU:	International Confederation of Free Trade Unions
IChemE:	(UK) Institute of Chemical Engineers
ILO:	International Labour Office
INES:	International Nuclear Event Scale
IPCS:	International Programme on Chemical Safety
NGO:	Non-governmental organisation
OECD/NEA:	OECD Nuclear Energy Agency

such a form and quantity that there is a risk of a major accident involving hazardous substance(s) which could cause serious harm to human health or damage to the environment, including property.

Hazard and Operability Study (HAZOP): One of several methods of hazard analysis carried out by application of guide words to engineering and instrument drawings to identify all deviations from design intent with undesirable effects for safety or operability, with the aim of identifying potential hazards.

Hazardous Substance: An element, compound, mixture or preparation which, by virtue of its chemical, physical or (eco)toxicological properties, constitutes a hazard.

Incidents: Accidents and/or near-misses.

Information: Facts or data or other knowledge which can be provided by any means including, for example, electronic, print, audio or visual.

Land-use Planning: Consists of various procedures to achieve both general zoning/physical planning as well as case-by-case decisionmaking concerning the siting of an installation or of other developments.

Major Accident: Any unplanned, sudden event which causes or is liable to cause serious injury to people or damage to buildings, plant, material or the environment.

Management: Employees at, or owners of, a hazardous installation who have the responsibility and authority to take decisions concerning the operation of an installation, including decisions relevant to safety and, where appropriate, employees at a corporate level in the enterprise having such authority.

Monitor (or) **Monitoring:** Use of checks, inspections, tours, visits, sampling and measurements, surveys, reviews or audits to measure compliance with relevant laws, regulations, standards, codes, procedures and/or practices; includes activities of public authorities, industry and independent bodies.

Near-miss: Any unplanned, sudden event which, but for the mitigation effects of safety systems or procedures, could have caused serious injury to people or serious damage to buildings, plant, material or the environment or could have involved a loss of containment possibly giving rise to significant adverse effects.

Notification: A requirement to provide specified information related to a hazardous installation in an appropriate manner to competent authorities.

OECD-based Enterprise: Enterprise whose corporate headquarters or effective operational control is located in an OECD Member country.

Probability: The likelihood that a considered occurrence will take place.

Product Stewardship: A system of managing products through all stages of their life cycle including customer use and disposal (with the objective of continuously improving safety for health and the environment).

Public Authorities: Government bodies at national, regional, local and international level with the authority to issue licenses, regulations, standards or other instructions having the force of law.

Reasonably Practicable: All which is possible subject to the qualification that the costs of the measures involved are not grossly disproportionate to the value of the benefits obtained from these measures.

Residual Risk: The risk still remaining after the implementation of risk management practices.

Risk: The combination of a consequence and the probability of its occurrence.

Risk Assessment: The value judgment of the significance of the risk, identified by a risk analysis taking into account any relevant criteria.

Risk Management: Actions taken to achieve or improve the safety of an installation and its operation.

Safety: A situation without unacceptable risks. For purposes of this text, "safety" embraces health, safety and environmental protection, including protection of property.

Safety Report: The written presentation of the technical, management and operational information concerning the hazards of a hazardous installation and their control in support of a justification for the safety of the installation.

Storage Facilities: Warehouses, tank farms and other facilities where hazardous substances are held.

Subsidiaries: Enterprises in which another enterprise has majority voting rights and/or effective operational control.

Transfer of Technology: The movement of process and other safety-related technology from one country to another, embracing not only the actual transfer but also the application of the technology as well as the operation of the plant.

Transfrontier Damage: Any serious damage to human health or the environment, including property, in the event of an accident suffered by a country other than the country where the accident originated.

Warehousekeeper: The person responsible for a storage facility, whether on the site of a hazardous installation or off-site.

Exercise or Test (for emergency response): A.1(h); A.2(q); D.11; E.1.2; E.1.13; E.1.14; E.2.1; E.3.2

Fire (fighting or protection from): B.4.8; B.4.11; B.5.4; B.5.61; B.5.63 - B.5.65; B.5.67; B.6.4; E.1.11; E.1.34

Hazard (analysis, assessment, evaluation or identification) (see also "Risk Assessment"): A.2(e); A.2.(q); B.4.1 - B.4.4; B.4.14; B.4.19; B.4.23; B.5.30; B.5.45; B.5.54; B.5.56; B.6.4; C.5; C.6; E.1.21; E.1.30; E.1.32; E.4.5; E.5.3; G.1.3; G.2.2; G.2.4

Hazard and Operability Studies (HAZOP): B.4.1

Human Error/Human Factor: B.4.5; B.4.10; B.5.44 - B.5.51; E.5.10

Incident (see also "Near-miss"): A.2(b); A.2(u); B.1.5; B.2.15; B.3.3; B.3.6; B.6.5; E.1.25; E.1.28; E.4.1; subsection E.5; G.3.1

Industry (see also "Management" and "Producers"): Section A (intro); A.1.(b); A.1(f); A.1(j); subsection A.4; A.6(a); B.1.2; B.1.4 - B.1.6; B.2.3; B.2.5; B.2.8 - B.2.10; B.2.16; B.2.19; subsection B.3; B.4.6; B.5.43; B.6.2.; B.6.4 - B.6.8; C.5; C.11; Section D (intro); D.2; D.12 - D.15; E.1.17; E.3.3; E.3.5; E.3.6; E.5.1; E.5.5; E.5.6; Section F (intro); F.1 - F.4; F.8; Section G (intro); G.1.4; H.1.4; H.1.5

Industry Association: see "Trade Association"

Inspections (see also "Audit" and "Monitoring"): A.1(c); A.2(l); B.2.13; B.4.14; B.5.46; B.5.52; B.5.54; B.5.63; B.6.4; B.6.8; E.5.9

Intermediate Substance: B.4.9; B.5.39; B.5.59

Investigation (of incidents, accidents and near-misses): A.1(d); A.2(u); B.1.3; B.5.24; B.5.42; B.6.4; Section E (intro); E.5.1; E.5.8 - E.5.11; G.2.8

Investment: Section A (intro); A.6(b); A.6(c); A.6(e); B.4.23 -B.4.26; Section G (intro); subsection G.1; subsection G.4

Land-use (Planning and Policies) (see also "Siting"): Section A (intro); subsection B.2 (intro); B.5.51; Section C; G.1.2; G.4.6; H.1.4

Licensing (of hazardous installations): A.1(e); B.2.14

Line Management: A.2(c); B.3.8; B.5.10; B.5.14; B.5.19; G.4.3

Maintenance: A.2(l); A.6(a); B.4.4; B.5.5; B.5.44; B.5.52; B.5.53; B.6.8; G.1.3; G.2.4; G.2.7; G.4.7; H.1.10

Management (see also "Industry"): Section A (intro); A.1(c); A.1(d); A.1(h); subsection A.2; A.3(c); Section B (intro); B.1.4 -B.1.7; B.2.5; B.2.10; B.2.13 - B.2.15; subsections B.3 - B.6; C.4; C.6; E.1.1; E.1.2; E.1.4; E.1.11; E.1.17; E.1.20; E.1.32; E.1.34; E.4.1; E.4.3; E.5.1 - E.5.3; E.5.8; E.5.10; E.5.11; F.9; F.10; G.1.1; G.1.4; G.4.3; H.1.8

Media: A.5(b); D.15; E.2.2; E.2.3; E.3.2; E.4.8

Modification: A.2(e); A.2(m); B.2.14; B.4.1; B.4.5; B.4.6; B.4.14; B.5.54 - B.5.58; C.3; C.6; C.9; G.2.7

Monitor or Monitoring (see also "Aud and "Review"): A.1(c); A.2(j); A.2 A.6(a); A.6(g) B.1.3; B.1.5; B.2.2; B.2.11; B.2.13; B.5.16; B.5.28; B B.5.59; subsection B.6; E.5.11; C H.1.10

Multilateral Financial Institutions: Section H (intro); A.6(h); subsection H.2

Near-miss (see also "Incident"): B.5.46; Section E (intro); E.5.1; E.5.3 - E.5.6; G.2.8

OECD-based Enterprise: A.6(b); A.6(c); A.6(e); Section G (intro); G.1.1; G.1.2; subsection G.2 (intro); subsection G.4

OECD Council Acts:
C(88)84(Final), "Decision of the Council on the Exchange of Information concerning Accidents Capable of Causing Transfrontier Damage": B.2.17; C.14

C(88)85(Final), "Decision-Recommendation of the Council concerning Provision of Information to the Public and Public Participation in Decision-Making Processes Related to the Prevention of, and Response to, Accidents Involving Hazardous Substances": C.13; D.1; D.5; E.1.38; E.1.39

C(89)88(Final), "Recommendation of the Council on the Application of the Polluter-Pays Principle to Accidental Pollution": A.5(a); B.3.2; E.1.18

Off-site Emergency (Preparedness) Plan: A.1(h); A.2(q); A.2(r); Section E (intro); E.1.2 - E.1.4; E.1.13; E.1.14; E.1.30 - E.1.41; E.4.2

On-site Emergency (Preparedness) Plan: A.1(h); A.2(q); A.2(r); A.2(s); Section E (intro); E.1.2 - E.1.4; E.1.13; E.1.14; E.1.20 -E.1.29

Operating Procedures: A.2(f); B.1.5; B.4.18; B.5.1; B.5.2; G.2.7

Non-governmental Organisation: B.6.1; D.12.3

Polluter Pays Principle: A.5(a); E.1.18

Producer: A.2(d); B.1.8; B.3.10

Product Stewardship: A.2(d); B.1.8; B.3.10

Public (including Public Potentially Affected in the Event of an Accident): A.1(f); A.1(i); A.2(p); A.5(b); B.1.2 - B.1.4; B.2.5; B.2.13; B.2.14; B.2.16; B.3.5; C.13; Section D; E.1.37 - E.1.39; E.2.1; E.2.2; E.4.6-E.4.8; E.4.10; E.5.1; G.1.4; G.4.6

Public Authorities: Section A (intro); subsection A.1; A.2(p); A.6(a); Section B (intro); B.1.2 - B.1.4; B.1.7; subsection B.2; subsection B.3 (intro); B.3.6; B.3.12; B.4.4; B.4.6; B.4.21; B.4.24; B.5.17; B.5.24; B.5.43; B.5.47; B.5.50; B.5.51; B.5.53; B.5.65; subsection B.6 (intro); B.6.1 - B.6.3; B.6.8 - B.6.13; Section C; Section D (intro); D.1 - D.4; D.12; D.15; E.1.1; E.1.2; E.1.4; E.1.10; E.1.11; E.1.16; E.1.17; E.1.19; E.1.20; E.1.30 - E.1.32; E.2.2; subsection E.3; E.4.1; E.4.3; E.4.10; subsection E.5; Section F (intro); F.1; F.3; F.4; F.8; F.9; Section G (intro); G.1.1; G.1.3; G.1.4; G.2.4; G.2.5; G.2.7; G.3.1; G.4.3; H.1.3

Quantified Risk Assessment (QRA): B.4.2; C.5

Recipient or Receiver (of technology, investment or aid): A.4.(b); A.6(f); B.4.18; B.4.20; Section G (intro); G.1.3; G.1.5; subsection G.2 (intro); G.2.1; G.2.4 - G.2.6; H.1.8; H.1.9; H.2.3

Repairs: A.2(m); B.5.54; B.5.57

Reporting (of incidents, accidents and near-misses): A.1(d); A.3(c); B.1.3; B.2.15; B.4.30; B.5.23 - B.5.25;

B.5.42; B.6.4; Section E (intro); E.5.1-E.5.7; G.3.1

Research: Section A (intro); A.1(k); A.4(c); B.2.16; B.4.1; B.4.5; B.4.28; B.5.2; E.3.6; Section F

Review (of safety or safety performance) (see also "Audit" and "Monitor"): Section A (intro); B.4.14; B.4.27; B.5.16; B.5.50; B.5.58; subsection B.6; G.2.4

Risk Assessment (see also "Quantified Risk Assessment" and "Hazard Assessment"): B.4.19; C.5; C.6; E.5.11; H.1.7

Risk Management: B.3.7; E.5.11

Safety Committee: A.2(k); B.5.19; B.5.20

Safety Culture (Corporate): A.2(a); B.1.5; B.3.5; B.3.6; B.5.14

Safety Objectives: Section A (intro); A.1(b); A.4(a); B.1.3; B.2; B.3.3; B.3.6; B.3.13; B.3.14; B.5.10; C.11; Section G (intro)

Safety Personnel: B.5.14

Safety Policy or Policies (Corporate): Section A (intro); A.2(a); A.2(j); A.3(a); B.1.5; B.1.9; subsection B.3; B.4.17; B.4.24; B.4.25; B.5.5; B.5.9; B.5.27; B.5.28; B.6.1; G.2.1; G.4.1; G.4.3 -G.4.5

Safety Report: B.2.13; B.4.4; E.1.4

Safety Representative: B.5.19; B.5.21; B.5.23; B.3.35; B.5.46

Safety Requirements: A.1(b); A.6(g); B.1.3; B.2.2; B.2.4; B.2.7 -B.2.11; B.2.13; B.2.16; B.3.8; B.4.6; B.4.16; B.4.25; B.5.11; B.5.12; B.5.22; B.5.52; B.5.60; B.6.4; B.6.5; B.6.8; B.6.9; F.2; G.2.1; G.2.4; G.3.1; G.4.1; H.1.10

Shareholder: B.6.1; B.6.7

Siting (see also "Land-use"): Section A (intro): A.6(a); B.2.14; Section C; G.3.1; G.4.6; H.1.4

Small and Medium-sized Enterprises or Companies: A.4(a); B.2.8; B.2.16; B.2.21; B.3.12; B.3.13; B.6.6; B.6.12; E.1.4; F.9

Storage or Storage Facilities: A.2(n); B.1.5; B.3.6; B.3.10; B.4.3; B.4.9; B.4.29; B.5.59 - B.5.67; C.6; E.1.21; E.3.5; G.2.4

Subsidiary: A.2(o); B.4.27 - B.4.30; subsection G.4

Supplier (of Technology): A.4(b); B.4.18 - B.4.20; G.1.3; subsection G.2; G.3.1

Technology Exporting Country: subsection G.3

Technology Importing Country: G.2.4; G.2.5; G.3.1

Technology Transfer (or Transfer of Technologies): Section A (intro); A.4(b); A.6(a) - A.6(e); B.4.18 - B.4.22; Section G (intro); G.1.1; G.1.3; G.1.5; subsection G.2; subsection G.3; subsection G.4 (intro); H.2.3

Test (for emergency response): see "Exercise"

Tolerability of Risk: see "Acceptability"

Trade Association or Industry Association: A.4(a); B.2.5; B.2.21; B.3.12 - B.3.14; B.4.6; E.5.4; G.2.4; H.1.5

Trade Secret: B.2.13; D.13; G.2.4; G.4.7

Trade Union (see also "Employee Representatives"): B.2.5; B.5.17; H.1.4

Training (and Education): A.1(h); A.1(l); A.2(g); A.6(f); B.2.3; B.2.16; B.3.9; B.4.4; B.4.18; B.5.4; B.5.10; B.5.14; B.5.19; B.5.21; B.5.27; B.5.30 - B.5.43; B.5.48; B.5.59; B.6.1; B.6.4; B.6.9; D.6; D.10; E.1.12; E.1.38; E.2.1; E.2.2; E.3.2; E.3.4; E.4.4; E.5.3; E.5.8; E.5.10; G.1.1; G.2.4; G.2.6; G.2.7; G.4.2; G.4.7; H.1.1; H.1.4; H.1.6; H.1.10; H.2.1

Transfrontier Damage or Effects: B.2.17; C.14; E.1.40

Transport (of hazardous substances): A.1(g); B.3.10; B.5.7; B.5.40; C.3; C.4; C.11; E.1.1; E.1.30; E.3.5; E.4.4; F.10

Warehousekeeper: A.2(n); B.5.59 - B.5.67

Warning Systems: A.1(i); B.2.17; E.2.1

References

Note: The publications listed in this Section were considered by the ad hoc Group to be particularly relevant and are generally available to the public. This list is not intended to be comprehensive.

Many of these publications are available in more than one language. This is especially likely to be true in the case of publications from international organisations, or from the governments of countries which have more than one official language.

The contact points in subsection L.8 below may be able to furnish additional information about publications which come from their country or organisation, as well as about programmes related to chemical accident prevention, preparation and response.

L.1 General

1. CCPA: *Responsible Care: A Total Commitment*, Ottawa, 1991.

2. Council of the European Communities: Council Directive of 24 June 1982 on the Major Accident Hazards of Certain Industrial Activities (82/501/EEC) ("The Seveso Directive"), *Official Journal of the European Communities* (OJ) No. L 230, August 1982, p. 1, as amended by Council Directive of 19 March 1987 (87/216/EEC), OJ No. L 85, 28 March 1987, p. 36, and by Council Directive of 24 November 1988 (88/610/EEC), OJ No. L 336, 7 December 1988, p. 14.

3. Dirección General de Protección Civil: *Guía para la communicación de riesgos industriales, guímicos y planes de emergencia*, Madrid.

4. Dirección General de Protección Civil: Legislación española de accidentes mayores de origin guímico, Madrid.

5. Environment Canada: *Bhopal Aftermath Review: Assessment of the Canadian Situation*, 1986.

6. HSE: *Assessment of the Toxicity of Major Hazard Substances* (by R. M. Turner and S. Fairhurst), Specialist Inspector Report No. 21, Health and Safety Executive Information Centre, London, 1989.

7. HSE: *Major Hazard Assessment: A Survey of Current Methodology and Information Sources* (by P. Kinsman), Specialist Inspector Report No. 29, Health and Safety Executive Information Centre, London, 1991.

8. ICFTU: *Is There a Bhopal Near You? Union's Drive to Prevent Chemical Disasters Worldwide. Trade Union Principles for Preventing Chemical Disasters*, Brussels, 1986.

9. ILO: *Convention Concerning Safety in the Use of Chemicals at Work (Convention No. 170)*, Geneva, 1990.

10. ILO: *Major Hazard Control: A Practical Manual*, Geneva, 1988.

11. ILO: *Prevention of Major Industrial Accidents* (an ILO Code of Practice), Geneva, 1991.

12. ILO: *Recommendation Concerning Safety in the Use of Chemicals at Work (Recommendation no.177)*, Geneva, 1990.

13. IPCS: *Guidelines for Poisons Control*, WHO, Geneva, 1992.

14. OECD: *Accidents Involving Hazardous Substances* (OECD Environment Monograph No. 24), Paris, 1989.

15. Secrétariat d'Etat auprès du Premier Ministre chargé de l'environnement et de la Prévention des Risques Technologiques et Naturels Majeurs: *Elements de sureté chimique et de désastrologie*, Tomes 1, 2 and 3, Paris, 1989.

L.2 Prevention

16. CCPS: *Guidelines for Technical Management of Chemical Process Safety*, New York, 1985.

17. CEFIC: *A Guide to Safe Warehousing for the European Chemical Industry*, Brussels, 1987.

18. CEFIC: *Views on the Quantitative Assessment of Risks from Installations in the Chemical Industry.*

19. CIA: *A Guide to Hazard and Operability Studies*, London, 1977.

20. CIA: *Guidelines for Safe Warehousing*, London, 1983.

21. CMA: *Process Safety Management (Control of Acute Hazards)*, Washington D.C., 1985.

22. Commission of the European Communities, JRC: Community Documentation Centre on Industrial Risk, *Bulletin*, Ispra.

23. CONCAWE: *Managing Safety*, Report No. 4/89, The Hague, 1989.

24. CONCAWE: *Quantified Risk Assessment*, Report No. 88/56, The Hague, 1988.

25. Crop Protection Institute of Canada: *Warehousing Standards*, Etobicoke, Ontario, 1990.

26. Dirección General de Protección Civil: NBE-CPI-91. *Condiciones de Protección contra incendios en edificios*, Madrid.

27. EFCE: *Risk Analysis in the Process Industries*, Rugby (UK), 1985.

28. EPA: *Review of Emergency Systems*, Report to Congress, Washington D.C., June 1988.

29. EPA, OSHA, et al.: *Managing Chemicals Safely: Putting It All Together*, Washington D.C., February 1992.

30. Federal Office of Environment, Forests and Landscape: *Handbook to the Ordinance on Prevention of Major Accidents. Vol. 1: Fixed Installations Containing Hazardous Materials* (in French and German), Berne, Switzerland, 1991.

31. HSE: *Effective Policies for Health and Safety. Review Drawn from the Work and Experience of the Accident Prevention Advisory Unit of HM Factory Inspectorate*, London: HMSO, 1990, ISBN 0 11 883254 9.

32. HSE: *Guide to the Control of Industrial Major Accident Hazards Regulations 1984*, Health and Safety Executive Booklet HS(R)21 (Rev), London: HMSO, 1990, ISBN 0 11 885579 4.

33. HSE: *Human Factors in Industrial Safety*, Health and Safety Series Booklet HS(G)48, London: HMSO, 1989, ISBN 0 11 8854860.

34. HSE: *Managing Safety - A Review of the Role of Management in Occupational Health and Safety*, Occasional Paper, Series No. 3,

London: HMSO, 1981, ISBN 0 11 88344 3 6.

35. HSE: *Monitoring Safety - An Outline Report on Occupational Safety and Health by the Accident Prevention Advisory Unit,* London, 1985.

36. OECD: *Workshop on Prevention of Accidents Involving Hazardous Substances : Good Management Practice* (OECD Environment Monograph No. 28), Paris, 1990.

37. OECD: *Workshop on Prevention of Accidents Involving Hazardous Substances - The Role of The Human Factor in Plant Operations* (OECD Environment Monograph No. 44), Paris, 1991.

38. OECD: *Workshop on the Role of Public Authorities in Preventing Major Accidents and in Major Accident Land-Use Planning* (Environment Monograph No. 30), Paris, 1990.

39. ORC: *Recommendations for Process Hazards Management of Substances with Catastrophe Potential,* Washington D.C., 1988.

40. OSHA: *3091 Safety and Heath Guide for Chemical Safety,* Washington D.C., 1986.

41. Secrétariat d'Etat auprès du Premier Ministre chargé de l'environnement et de la Prévention des Risques Technologiques et Naturels Majeurs: *Prévention des risques industriels : Législation des installations classées - Application de la Directive Seveso,* Paris, 1990.

42. UNEP: *Guidelines for Assessing Industrial Environmental Impact and Environmental Criteria for the Siting of Industry,* Paris, 1990.

43. UNEP: *Guidelines on Risk Management and Accident Prevention in the Chemical Industry,* Paris, 1982.

44. UNEP: *Storage of Hazardous Materials* (Technical Report Series No. 3), Paris, 1990.

45. WHF: *Blueprint for Prevention - A Guide to Preventing Chemical Releases,* Washington D.C., 1989.

46. World Bank: *Techniques for Assessing Industrial Hazards,* World Bank Technical Papers No. 55, Washington D.C., 1988.

L.3 Land-Use Planning

47. HSE: *Risk Criteria for Land-Use Planning in the Vicinity of Major Industrial Hazards,* London: HMSO, 1989, ISBN 0 11 885491 7.

48. Netherlands Directorate-General for Environmental Protection: *Dutch National Environmental Policy Plan - Premises for Risk Management: Risk Limits in the Context of Environmental Policy,* Ministry of Housing, Physical Planning and Environment, 1988-89.

49. OECD: *Workshop on the Role of Public Authorities in Preventing Major Accidents and in Major Accident Land-Use Planning* (OECD Environment Monograph No. 30), Paris, 1990.

50. Secrétariat d'Etat auprès du Premier Ministre chargé de l'environnement et de la Prévention des Risques Technologiques et Naturels Majeurs: *Maîtrise de l'urbanisation autour des sites industriels à haut risque,* Paris, 1990.

L.4 Community Awareness

51. EPA, et al. *Risk Communication About Chemicals in Your Community: A*

Manual For Local Officials (EPA et al. 230/09-89-066), Washington D.C., 1989.

52. EPA: *Seven Cardinal Rules of Risk Communication*, Washington D.C., April 1988.

53. OECD: Decision of the Council on the Exchange of Information Concerning Accidents Capable of Causing Transfrontier Damage [C(88)84(Final)].

54. OECD: Decision-Recommendation of the Council Concerning Provision of Information to the Public and Public Participation in Decision-Making Processes Related to the Prevention of, and Response to, Accidents Involving Hazardous Substances [C(88)85(Final)]. (Guiding Principles are included as an Appendix to this Council Act.)

55. OECD: *Workshop on the Provision of Information to the Public and on the Role of Workers in Accident Prevention and Response* (OECD Environment Monograph No. 29), Paris, 1990.

L.5 Emergency Preparedness and Response

56. Canadian Standards Association: *Emergency Planning for Industry*, CAN/CSA-Z731-M91, Toronto, 1991.

57. CEFIC: *Checklist for On-site Emergency Plans*, Brussels, 1990.

58. CEFIC: *Communication between the Chemical Industry and the Community on Emergency Response Organisation (The CICERO Process)*, Brussels, 1988.

59. CIA: *Guidelines for Chemical Sites on Off-site Aspects of Emergency Procedures*, London, 1984.

60. CMA: *CAER: The Next Phase - Program Handbook.*

61. CONCAWE: *Emergency Planning Guidance Notes*, Report No. 11/87, The Hague, 1987.

62. EPA, Dept. of Transportation, and Federal Emergency Management Agency: *Technical Guidance for Hazards Analysis - Emergency Planning for Extremely Hazardous Substances*, Washington D.C., 1987.

63. HSE: *The Control of Industrial Major Accident Hazards Regulations 1984 (CIMAH): Further Guidance on Emergency Plans* (Health and Safety Series Booklet HS(G)25), London: HMSO, 1985, ISBN 0 11 883831 8.

64. IAEA: *Planning for Off-Site Response to Radiation Accidents in Nuclear Facilities*, Safety Series No. 55, Vienna, 1981.

65. IAEA: *Principles for Establishing Intervention Levels for the Protection of the Public in the Event of a Nuclear Accident or Radiological Emergency*, Safety Series No. 72, Vienna, 1985 (under revision).

66. IAEA, OECD/NEA, INES: *The International Nuclear Event Scale*, IAEA, Vienna, 1990.

67. International Commission on Radiological Protection: *Protection of the Public in the Event of Major Radiation Accidents: Principles for Planning*, Publication No. 40, Pergamon Press, 1984 (under revision).

68. Ministère de l'Intérieur et Ministère de l'Environnement: *Guide d'élaboration d'un plan d'opération interne*, Paris, 1985.

69. OECD: Recommendation of the Council on the Application of the Polluter-Pays Principle to Accidental Pollution [C(89)88(Final)]. (Guiding

Principles are included as an Appendix to this Council Act.)

70. OECD: Recommendation of the Council on Principles concerning Transfrontier Pollution [C(74)224].

71. OECD: *Workshop on Emergency Preparedness and Response and on Research in Accident Prevention, Preparedness and Response* (OECD Environment Monograph No. 31), Paris, 1990.

72. OECD: *Users Guide to Hazardous Substance Data Banks Available in OECD Member Countries*, Paris, 1991.

73. OECD: *Users Guide to Information Systems Useful to Emergency Planners and Responders Available in OECD Member Countries*, Paris, 1991.

74. OECD/NEA: *Emergency Planning Practices and Criteria after the Chernobyl Accident, A Critical Review*, Paris, 1988.

75. OECD/NEA: *Protection of the Population in the Event of a Nuclear Accident, A Basis for Intervention*, Paris, 1990.

76. OECD/UNEP: *International Directory of Emergency Response Centres* (OECD Environment Monograph No. 43; UNEP-IE/PAC Technical Report No. 8), Paris, 1991.

77. OSHA: *3008 How to Prepare for Workplace Emergencies*, Washington D.C., 1991.

78. UNEP: *APELL - Awareness and Preparedness for Emergencies at Local Level: A Process for Responding to Technological Accidents* (the APELL Handbook), Paris, 1988.

79. U.S. National Response Team: *Developing a Hazardous Materials Exercise Program: A Handbook for State and Local Officials*, Washington D.C., 1990.

80. U.S. National Response Team: *Hazardous Materials Emergency Planning Guide*, Washington D.C., 1987.

81. WHO: *Emergency Response to Chemical Accidents* (Health Aspects of Chemical Safety Interim Document No. 1), Copenhagen, 1981.

82. WHO: *Nuclear Power: Accidental Releases - Practical Guidance for Public Health Action*, WHO Publications, European Series No. 21, Copenhagen, 1987.

83. WHO: *The Organisation and Requirements for an Emergency Preparedness System.*

L.6 International Investment and Transfer of Technology

84. CEFIC: *Guidelines on Transfer of Technology and Safety, Health and Environmental Aspects*, Brussels, 1991.

85. CEFIC: *Principles and Guidelines for the Safe Transfer of Technology*, Brussels, 1987.

86. ILO: *Safety, Health and Working Conditions in the Transfer of Technology to Developing Countries* (an ILO Code of Practice), Geneva, 1988.

87. ILO: *Tripartite Declaration of Principles concerning Multinational Enterprises and Social Policy*, Geneva, 1982.

88. OECD: The OECD Declaration and Decisions on the International Investment and Multinational Enterprises - Basic Texts, Paris, March 1992.

89. UN General Assembly Resolution 43/186 (concerning the second UN conference on the least developed countries).

90. UN General Assembly Resolution 44/228 (concerning the UN conference on Environment and Development).

91 UNCTC: Doc. E1990/94, Letter dated 31 May 1990 from the Chairman of the Reconvened Special Session of the Commission of Transnational Corporations to the President of the Economic and Social Council, *Development and International Co-operation* (Draft Code of Conduct), New York, 12 June 1990.

L.7 Glossary

92. CEFIC: *Nomenclature in Risk Assessment of Industrial Installations*, Brussels, 1988.

93. ICHEME, *Nomenclature for Hazard and Risk Assessments in the Process Industries*, Rugby (UK), 1985.

94. ILO: *Prevention of Major Industrial Accident Hazards* (an ILO Code of Practice), Geneva, 1991.

95. OECD: The OECD Declaration and Decisions on the International Investment and Multinational Enterprises - Basic Texts, Paris, March 1992.

L.8 Contact Points for Publications and Related Information

The contact points listed below should be able to provide information on how to obtain publications prepared within their country or organisation.

These contact points may also be able to provide additional information concerning the programmes within their country or organisation related to accident prevention, preparedness and response.

Australia

National Occupational Health and Safety Commission
(Worksafe Australia)
92 Parramatta Road
Camperdown, Sydney NSW 2050
TEL: (61) (2) 565 9555
FAX: (61) (2) 565 9202

Austria

Mr. Gustav Neubauer
Federal Ministry of the Environment, Youth and Family
Chemical Division
Untere Donaustrasse 11
A-1020 Vienna
TEL: (43) (1) 211 32, EXT 2020
FAX: (43) (1) 211 32, EXT 2008

Belgium

Ministère de la Santé publique et de l'Environnement
Cellule Environnement - Prévention des risques industriels
Boulevard Pachéco, 19, BP 7
1010 Brussels
TEL: (32) (2) 210 48 55
FAX: (32) (2) 210 48 52

Canada

Prevention Division
Environmental Emergencies Branch
Conservation and Protection
Environment Canada
Ottawa K1A 0H3
TEL: (1) (613) 941 0792
FAX: (1) (819) 953 5361
(National Environmental Emergency Centre)

Denmark

J.H. Schultz Information A/S
Ottillavej 18
2500 Valby

TEL: (45) (36) 44 22 66
FAX: (45) (36) 44 01 41

Finland

Accident prevention and preparedness:

Mr. Esko Ulvelin
Technical Inspection Centre
P.O. Box 44
00811 Helsinki
TEL: (358) (0) 6167 201
FAX: (358) (0) 7591 596

Emergency preparedness and response:

Mr. Jukka Metso
Ministry of the Interior
Rescue Department
P.O. Box 257
00171 Helsinki
TEL: (358) (0) 160 2985
FAX: (358) (0) 160 4672

Environment in general:

Mr. Olli Pahkala
Ministry of the Environment
P.O. Box 399
00121 Helsinki
TEL: (358) (0) 1991 253
FAX: (358) (0) 1991 399

France

Ministère de l'environnement
Service de l'environnenment industriel
14, boulevard du Général Leclerc
92400 Neuilly-sur-Seine
FAX: (33) (1) 40 81 33 22

Germany

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Bismarckplatz 1
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FAX: (31) (70) 317 4919

Norway

Ms. Berit Borgen
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Annex I

Decision of the Council on the Exchange of Information Concerning Accidents Capable of Causing Transfrontier Damage

Adopted by the Council at its 687th Session on 8th July 1988, C(88)84(Final)

THE COUNCIL,

Having regard to Article 5 a) of the Convention on the Organisation for Economic Co-operation and Development of 14th December 1960;

Having regard to paragraph 3 of Article 6 of the Convention on the Organisation for Economic Co-operation and Development of 14th December 1960;

Having regard to the Recommendations of the Council of 14th November 1974 on Principles Concerning Transfrontier Pollution, of 11th May 1976 on Equal Right of Access in Relation to Transfrontier Pollution, of 17th May 1977 for the Implementation of a Regime of Equal Right of Access and Non-Discrimination in Relation to Transfrontier Pollution, and of 21st September 1978 for Strengthening International Co-operation on Environmental Protection in Frontier Regions [C(74)224, C(76)55(Final), C(77)28(Final), C(78)77(Final)];

Having regard to the Recommendations of the Council of 26th July 1983 concerning the Exchange of Confidential Data on Chemicals and concerning the OECD List of Non-Confidential Data on Chemicals [C(83)97(Final), C(83)98(Final)];

Having regard to the Declaration on Environment: Resource for the Future adopted by the Governments of OECD Member countries and of Yugoslavia at the session of the Environment Committee at Ministerial Level on 20th June 1985 stating that "they will ensure the existence of appropriate measures to control potentially hazardous installations, including measures to prevent accidents";

Having regard to the Conclusions adopted by the Third High Level Meeting of the Chemicals Group on 17th-18th March 1987 regarding the prevention of, and response to, unintended releases of hazardous substances in the environment.

Considering that certain hazardous installations are likely to cause serious damage to human health and the environment in the event of a major accident;

Considering that it is necessary to promote new measures for the prevention of accidents involving hazardous substances and for limiting the adverse consequences of such accidents;

Considering the need to ensure that frontiers between Member countries do not constitute an obstacle to the transmission of information needed in order to protect human health and the environment in the event of accidents capable of causing transfrontier damage;

Considering that increased co-operation between Member countries should help to address the international problems which can arise with hazardous installations located in their frontier regions;

On the proposal of the Environment Committee;

DECIDES:

1. Member countries concerned shall exchange information and consult one another, on a reciprocal basis if so desired, with the objective of preventing accidents capable of causing transfrontier damage and reducing damage should such an accident occur.

2. Member countries shall take all necessary practical steps to implement, on a reciprocal basis if so desired, the provisions set out in Appendix I to this Decision, which is an integral part of this Decision, including, as need be, to conclude arrangements or agreements aimed at specifying procedures for exchanging information relating to accidents capable of causing transfrontier damage.

3. Definitions of terms used in this Decision are given in Appendix II, which is an integral part of this Decision.

4. The Environment Committee will examine, within three years, actions taken by Member countries pursuant to this Decision.

5. The Environment Committee will review Appendix III, which is an integral part of this Decision, within three years and will propose, as need be, a revised minimum list for the identification of hazardous installations.

Appendix I to Annex I [OECD Council Act C(88)84(Final)]

Provisions Relating to the Exchange of Information

Title A. Exchange of Information on Hazardous Installations

1. Countries concerned shall exchange relevant information for the prevention of, and the response to, accidents at hazardous installations. To this end, the country of the installation shall provide to the exposed country relevant information concerning existing or planned hazardous installations located in the area under its national jurisdiction and capable of causing transfrontier damage in the event of an accident, and the exposed country shall provide to the country of the installation relevant information concerning the area under its jurisdiction capable of being affected by such transfrontier damage.

2. Relevant information supplied by the country of the installation shall include the following information in so far as it is available in accordance with domestic law to the public authorities of the country of the installation:

   a) Location and general description of the hazardous installation capable of causing transfrontier damage;

   b) Common chemical names or, if more appropriate, the generic names or general danger classifications of the main hazardous substances which may cause transfrontier damage in the event of a major accident;

   c) The legislative, regulatory and administrative requirements, including any conditions imposed by the licensing authorities, under which the installation operates;

   d) General information concerning the nature, extent and likely effects off-site of a major accident on human health or the environment, including property; and

   e) Information on the off-site emergency plan relevant to the exposed country.

3. Relevant information supplied by the exposed country relating to the area under its national jurisdiction capable of being affected by transfrontier damage in the event of an accident at the hazardous installation shall include the following information, in so far as it is available in accordance with domestic law to the public authorities of the exposed country:

   a) Distribution of the population, including sensitive groups;

   b) Location and general description of pertinent properties and activities which could be adversely affected; and

   c) Location of natural resources, protected areas, sensitive ecosystems and historical monuments which could be damaged.

4. The countries concerned shall consult one another in case of difficulties in the identification of those hazardous installations under their respective national jurisdictions which shall be subject to an exchange of information.

Title B. Proposals for a Hazardous Installation

5. Where a Member country, through any forum or by any process to which the public has access and through which it can make representations, determines any human health or environmental risks which may be posed by an accident at a proposed hazardous installation or where a Member country requires the completion of a study concerning the impact on human health or the environment of a proposed hazardous installation in the event of an accident, it shall transmit to an exposed country any conclusions of the enquiry or of the study which it makes available to the public and shall implement the procedures described in Title A above.

6. Where the country of the installation has transmitted to the exposed countries the conclusions referred to in paragraph 5 above, it shall allow a reasonable amount of time for consultations with the exposed countries prior to implementing the proposal for a hazardous installation.

7. Where a Member country convenes or holds, as part of existing procedures, a meeting, enquiry, hearing or session of a tribunal, at which a decision is to be taken or an advice given on the establishment of a hazardous installation, it shall provide the exposed countries with the venues and dates of such a meeting, enquiry, hearing or session at which the proposed hazardous installation will be considered.

8. The country of the installation shall transmit to the exposed countries a copy of the documents concerning any proposal for a hazardous installation which are made available to the public in the country of the installation in accordance with its domestic law.

Title C. Organisation of Emergency Measures

9. The countries concerned shall consult one another with a view to co-ordinating the off-site emergency plans relating to a hazardous installation capable of causing transfrontier damage. They shall inform one another of the communication systems to be used, the main features of their emergency plans and the means available for emergency response in the event of an accident capable of causing transfrontier damage.

10. The countries concerned shall inform one another of the instructions given to their respective population on how to respond in the event of an accident capable of causing transfrontier damage and on any evacuation or protection measures to be taken in the event of such an accident or imminent threat of such an accident.

Title D. Transmission of the Emergency Warnings

11. In the event of an accident or imminent threat of an accident capable of causing transfrontier damage, the country of the installation shall immediately transmit an emergency warning to the exposed countries.

Title E. Organisation of the Subsequent Transmission of Information Relating to the Accident

12. In the absence of an agreed system for transmitting information relating to an accident, the country of the installation shall communicate to the authorities responsible for receiving emergency warnings in the exposed countries appropriate information relating to the accident or imminent threat of an accident.

13. The countries concerned shall draw up, as need be, procedures and practical arrangements for rapid and effective transmission of information relating to an accident or to the imminent threat of an accident capable of causing transfrontier damage, and they shall set up, as need be, systems for communication of pertinent information following an accident. The information to be transmitted shall include:

    a) Accident location and brief description of the circumstances;

    b) Immediate effects of the accident;

    c) Emergency measures planned and actions taken;

    d) Chemical identity, quantity and physical form of the hazardous substances which may affect an exposed country; and

    e) Data available for evaluating the probable impact of the accident in an exposed country.

Title F. Confidentiality

14. The obligations of the countries concerned to transmit the relevant information referred to above shall be subject to the limitations of their domestic law concerning the protection of confidential information, including both proprietary data and information protected for reasons of national security.

15. The receiving country shall respect the confidentiality of the information received. It shall not make available to its public information that is not made available to the public in the country supplying it.

16. The information supplied in the framework of the implementation of this Decision may be used only for assessing the nature and extent of the potential transfrontier damage and for reducing the consequences of an accident beyond the frontier or for coping with the imminent threat of an accident capable of causing transfrontier damage.

Title G. Identification of Competent Authorities

17. The countries concerned shall notify one another of the identity and details of the following:

    a) National, regional and/or local authorities responsible for transmitting or receiving the relevant information referred to in paragraphs 2 and 3 above;

    b) Authorities responsible for implementing the off-site emergency plans referred to in paragraphs 9 and 10 above; and

    c) Authorities responsible for transmitting and receiving the emergency warnings referred to in paragraph 11 above at national, regional and/or local levels.

Title H. Information from other Sources

18. The above provisions shall not prejudice the direct transmission of information by the operator of a hazardous installation to the authorities or to the public in the exposed countries with the objective of preventing accidents in the hazardous installation or reducing transfrontier damage should an accident occur.

Title I. Strengthening International Co-operation

19. The countries concerned shall co-operate in ensuring that persons in

the exposed country who might be affected by an accident in the country of the installation receive the same information that is provided to persons who might be affected in the country of the installation.

20. The above provisions shall be taken into account by Member countries when preparing agreements or arrangements with non-Member countries on the subject area covered by this Decision.

21. The above provisions shall not prejudice the organisation of wider exchanges of information or consultations between the countries concerned with the objective of preventing accidents involving hazardous substances and reducing transfrontier damage should an accident occur; nor shall it prejudice the conclusion of subsequent agreements intended to specify the scope and extent of the exchanges of information provided for under this Decision.

Appendix II to Annex I [OECD Council Act C(88)84(Final)]

Definitions

For the purpose of this Decision,

a) "Hazardous installation" means an industrial installation which contains more than the threshold quantity of any of the hazardous substances mentioned in Appendix III and in which are used, stored or produced such hazardous substances which are capable, in the event of an accident, of causing serious damage to human health or the environment, including property, outside the installation site, with the exclusion of military or nuclear installations;

b) "Proposal for a hazardous installation" means any proposal made to a competent authority to set up a new hazardous installation and any proposal involving substantial modification of an existing hazardous installation;

c) "Accident" means any occurrence involving a hazardous substance such as a major emission, fire or explosion at a hazardous installation leading to serious damage to human health or the environment, including property;

d) "Hazardous substance" means any substance which is capable of causing serious damage to human health or the environment, including property, in the event of an accident in a hazardous installation and which is identified in Appendix III;

e) "Transfrontier damage" means any serious damage to human health or the environment, including property, suffered by an exposed country in the event of an accident and, in general, by the country of the accident;

f) "Sensitive group" means any group of persons particularly sensitive to the consequences of an accident as a result of their age, health conditions or way of life;

g) "Country of the installation" means any Member country within whose jurisdiction there is a hazardous installation or a proposal for a hazardous installation;

h) "Exposed country" means any Member country other than the country of the installation which suffers serious damage as a result of an accident, or which is capable of being affected by such damage in an area under its national jurisdiction;

i) "Countries concerned" means the country of the installation in the exposed country or countries.

Appendix III to Annex I [OECD Council Act C(88)84(Final)]

Threshold Quantities of Hazardous Substances

Hazardous Substances	Threshold quantity (tonnes)
1. Flammable, explosive or oxidizing substances:	
Flammable gases* including liquefied flammable gases	200
Highly flammable liquids**	50 000
Ethylene oxide	50
Sodium chlorate	250
Ammonium nitrate	2 500
2. Substances toxic to man and/or the environment:	
Ammonia	500
Chlorine	25
Hydrogen cyanide	20
Hydrogen fluoride	50
Methyl isocyanate	0.15
Sulphur dioxide	250
Acrylonitrile	200
Hydrogen sulphide	50
Phosgene	0.75
Methylbromide	200
Tetraethyl lead	50
Disulfoton	0.1
Parathion	0.1
Warfarin	0.1
Aldicarb	0.1

The hazardous substances and threshold quantities mentioned above are without prejudice to those used in more extensive lists of hazardous installations developed in a national or international context.

* Flammable gases: substances which in the gaseous state at normal pressure and mixed with air become flammable and the boiling point of which at normal pressure is 20°C or below.

** Highly flammable liquids: substances which have a flash point lower than 21°C and the boiling point of which at normal pressure is above 20°C.

Decision-Recommendation of the Council Concerning Provision of Information to the Public and Public Participation in Decision-Making Processes Related to the Prevention of, and Response to, Accidents Involving Hazardous Substances

Adopted by the Council at its 687th session on 8th July 1988, C(88)85(Final)

THE COUNCIL,

Having regard to Articles 5 a) and 5 b) of the Convention on the Organisation for Economic Co-operation and Development of 14th December 1960;

Having regard to paragraph 3 of Article 6 of the Convention on the Organisation for Economic Development of 14th December 1960;

Having regard to the Declaration on Anticipatory Environmental Policies adopted by the Governments of OECD Member countries and of Yugoslavia at the session of the Environment Committee at Ministerial Level on 8th May 1979 stating that "they will encourage public participation, where possible, in the preparation of decisions with significant environmental consequences, inter alia, by providing as appropriate information on the risks, costs and benefits associated with the decisions";

Having regard to the Recommendation of the Council of 8th May 1979 on the Assessment of Projects with Significant Impact on the Environment [C(79)116] in which Member governments were recommended to "introduce, where appropriate, practical measures for informing the public and for participation by those who may be directly or indirectly affected, at suitable stages in the process of arriving at decisions on projects" having a potentially significant impact on the environment;

Having regard to the Recommendation of the Council of 26th July 1983 concerning the OECD List of Non-Confidential Data on Chemicals [C(83)98(Final)];

Having regard to the Declaration on "Environment: Resource for the Future" adopted by the Governments of OECD Member countries and of Yugoslavia at the session of the Environment Committee at Ministerial Level on 20th June 1985 stating that "they will ensure the existence of appropriate measures to control potentially hazardous installations, including measures to prevent accidents";

Having regard to the conclusions adopted by the Third High Level Meeting of the Chemicals Group on 17th-18th March 1987 regarding the prevention of, and response to, unintended releases of hazardous substances to the environment;

Considering that the potentially affected public has a right to be informed about the hazards to human health or the environment, including property, which could arise from accidents occurring at hazardous installations;

Considering that persons potentially affected in the event of an accident at a hazardous installation should be well-informed of measures which need to

be taken by them in order to mitigate adverse consequences of such an accident;

Considering that such persons should have the opportunity to be heard, as appropriate, in decision-making processes related to prevention of, and response to, accidents involving hazardous substances;

On the proposal of the Environment Committee;

1. DECIDES that Member countries shall ensure, through the legal and procedural means they deem appropriate, that the potentially affected public:

   a) is provided with specific information on the appropriate behaviour and safety measures they should adopt in the event of an accident involving hazardous substances;

   b) is provided with general information on the nature, extent and potential off-site effects on human health or the environment, including property, of possible major accidents at a planned or existing hazardous installation*; and

   c) has access to such other available information needed to understand the nature of the possible effects of an accident (such as information on hazardous substances capable of causing serious off-site damage) and to be able to contribute effectively, as appropriate, to decisions concerning hazardous installations and the development of community emergency preparedness plans.

2. RECOMMENDS that Member countries take action to facilitate, as appropriate, opportunities for the public to comment prior to decisions being made by public authorities concerning siting and licensing of hazardous installations and the development of community emergency preparedness plans.

3. RECOMMENDS that, in implementing this Decision-Recommendation, Member countries take into account the Guiding Principles set out in the Appendix.

4. INSTRUCTS the Environment Committee to review, within three years, actions taken by Member countries in pursuance of this Decision-Recommendation.

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* The definition of "hazardous installation" for purposes of this Decision-Recommendation is set out in paragraph 2 of the Appendix.

Appendix to Annex II [OECD Council Act C(88)85(Final)]

Guiding Principles on provision of information to the public and public participation in decision-making processes related to the prevention of, and response to, accidents involving hazardous substances

I. General Principles

1. The following Guiding Principles are designed to facilitate the implementation by Member countries of programmes and policies to ensure that the potentially affected public is well-informed about existing or planned hazardous installations and to facilitate the opportunities for the public to provide input, as appropriate, into decision-making by public authorities concerning such installations. These Principles do not prejudice public authorities from instituting more extensive requirements related to provision of information to the public or public participation.

2. These Guiding Principles relate to such hazardous installations defined under applicable law as being capable of giving rise to hazards sufficient to warrant the taking of precautions off-site, excluding nuclear or military installations.

3. These Guiding Principles focus on objectives to be achieved with respect to provision of information to the public and public participation, and not on the procedural approaches which should be followed. It is recognized that Member countries allocate responsibility differently between the public and private sectors and among national, regional and local governments and that Member countries have differing legal and administrative frameworks with regard to prevention of accidents and development of community emergency plans.

4. In implementing this Decision-Recommendation, Member countries should give consideration to the protection of confidential information, as defined under domestic law, including both proprietary data and information protected for reasons of national security.

II. Division of Responsibilities

5. Industry and public authorities each have responsibilities to the public concerning prevention of, and response to, accidents involving hazardous substances.

6. Industry is a primary source of that information which should be made publicly available. It therefore has a responsibility to provide this information to public authorities and, directly or indirectly, to the public. Industry should be prepared to work with the authorities which develop community emergency plans.

7. Public authorities have the responsibility of ensuring that adequate and timely information is provided to the potentially affected public and that appropriate opportunities are available for public participation in certain decision-making processes. Public authorities also have the responsibility of ensuring that adequate community emergency plans are in effect.

III. Provision of Information to the Public

Information to be Provided without Request

8. Those members of the public who might be affected were an accident to occur should be provided with certain information, without request, so that they will be aware of the hazards arising from the installation and will be able to respond appropriately should an accident occur.

9. This information should include specific guidance related to public response in the event of an accident, such as:

   - details on how the potentially affected public will be warned in the event of an accident;

   - details of the actions and behaviour the potentially affected public should take in the event of an accident; and

   - the source of post-accident information (e.g., radio or television frequencies).

   It should clearly be indicated therein that the information should be read immediately and be kept in a convenient place for reference in the event of an accident.

10. The guidance on what to do in the event of an accident should be adapted to meet the needs of groups of sensitive persons, for example in schools, hospitals and homes for aged people.

11. The following information should also be provided, without request, to the potentially affected public:

    - the name of the operator of the installation and the address of the installation;

    - the common names or, if more appropriate, the generic names or the general danger classification of the substances involved at the installation which could give rise to an accident capable of causing serious off-site damage, with an indication of their principal harmful characteristics;

    - general information relating to the nature of the hazards of accidents capable of causing serious off-site damage, as well as their potential effects on human health and the environment, including property; and

    - details of how further explanatory information can be obtained.

12. The information described in paragraphs 9 and 11 should be comprehensible to the general public and be provided in a format which is easily read and understood.

13. This information should be provided in a timely fashion, be reissued periodically as appropriate, and be updated as necessary.

14. The potentially affected public should also be provided with notification of applications for siting or licensing of a hazardous installation. Decisions concerning such applications should also be publicised.

15. In those cases in which a hazardous installation is located in a frontier region and the country of such installation has transmitted to the other country information referred to above in paragraphs 9 and 11, the country receiving this information should ensure that such information is provided to all persons within its jurisdiction potentially affected in the event of an accident.

16. Arrangements should be made, before an accident, for the timely transmission of information to the public and the media in the case of an accident in

order to mitigate adverse effects and to allay unjustified fears.

Information Available upon Request

17. The public should have access, upon request, to certain additional information to allow it to understand the nature of the hazards arising from hazardous installations, understand the reasons for guidance provided, and participate effectively in decision-making processes, as appropriate. Such information would include, for example:

- any information concerning the hazardous installation which has previously been made publicly available by the installation or public authorities (as appropriate, licenses, environmental impact assessments, operating permits, safety reports, hearing documents);
- a general description of the types of activities undertaken at the installation;
- additional guidance concerning actions to be taken by the public to protect human health and the environment, including property, in case of an accident and the reasons for such guidance; and
- other information necessary for effective participation in decision-making, as appropriate.

IV. Public Participation

18. Whenever possible and appropriate, the potentially affected public should be given the opportunity to participate, by providing their views and concerns, when decisions related to siting and licensing of hazardous installations and the development of community emergency plans are being made by public authorities.

19. In all cases, adequate information about the opportunity to participate should be given.

20. As appropriate, a variety of mechanisms for public participation in decision-making processes can be used. These mechanisms can include those for direct public participation, such as open public hearings, and those for indirect public participation by means of, for example, open consultative procedures.

21. In some Member countries, local safety committees have been established with representatives of the installation, local authorities and local residents which, *inter alia*, facilitate the flow of information from the installation to persons who live and work in the area and co-ordinate local participation in appropriate decision-making processes.

22. The mechanisms for public participation and the scope of participation should be adapted to the nature of the decision being made and to who may be affected by the decision, while taking account of applicable law and practice.

23. In determining who should be given the opportunity to participate in decision-making processes, public authorities should consider which persons are seriously threatened by a potential accident and the nature of the decision being made. For example, in the case of the development of a community emergency preparedness plan, the local community near the hazardous installation might have the opportunity to participate. In the case of a siting decision for an installation which could have serious adverse effects on a watershed, national park or natural resources of more than local concern, provision might be made for broader participation, for example by allowing comments by representatives

of public-interest organisations (e.g., environmental, agricultural or forestry groups).

24. Providing an opportunity for public participation should not affect the ultimate responsibilities of the public authorities with respect to decision-making in this area.

Annex III

Recommendation of the Council on the Application of the Polluter-Pays Principle to Accidental Pollution

Adopted by the Council at its 712th session on 7th July 1989, C(89)88(Final)

THE COUNCIL,

Having regard to Article 5 b) of the Convention on the Organisation for Economic Co-operation and Development of 14th December 1960;

Having regard to the Recommendation of the Council of 26th May 1972 on Guiding Principles Concerning International Economic Aspects of Environmental Policies [C(72)128];

Having regard to the Recommendation of the Council of 14th November 1974 on the Implementation of the Polluter-Pays Principle [C(74)223];

Having regard to the Recommendation of the Council of 28th April 1981 on Certain Financial Aspects of Action by Public Authorities to Prevent and Control Oil Spills [C(81)32(Final)];

Having regard to the Concluding Statement of the OECD Conference on Accidents Involving Hazardous Substances held in Paris on 9th and 10th February 1988 [C(88)83];

Considering that this Conference concluded that "operators of hazardous installations have the full responsibility for the safe operation of their installations and for taking all appropriate measures to prevent accidents" and that "operators of hazardous installations should take all reasonable measures... to take emergency actions in case of an accident";

Considering that such responsibility has repercussions on the allocation of the cost of reasonable measures aimed at preventing accidents in hazardous installations and limiting their consequences and that the Conference concluded that "the Polluter-Pays Principle should be applied, as far as possible, in connection with accidents involving hazardous substances";

Considering that public authorities are often required to take expensive action in case of accidental pollution from hazardous installations and may find it necessary to undertake costly accident preparedness measures in relation to certain hazardous installations;

Considering that closer harmonization of laws and regulations relating to the allocation of the cost of measures to prevent and control accidental pollution is likely to reduce distortions in international trade and investment;

On the proposal of the Environment Committee,

I. RECOMMENDS that, in applying the Polluter-Pays Principle in connection with accidents involving hazardous substances, Member countries take into account the "Guiding Principles Relating to Accidental Pollution" set out in the Appendix which is an integral part of this Recommendation.

II. INSTRUCTS the Environment Committee to review the actions taken by Member countries pursuant to this Recommendation and to report to the Council within three years of the adoption of this Recommendation.

Appendix to Annex III [OECD Council Act C(89)88(Final)]

Guiding Principles Relating to Accidental Pollution

Scope and Definition

1. The Guiding Principles described below concern some aspects of the application of the Polluter-Pays Principle to hazardous installations.

2. For the purposes of this Recommendation:

   a) "Hazardous installations" means those fixed installations which are defined under applicable law as being capable of giving rise to hazards sufficient to warrant the taking of precautions off-site, excluding nuclear or military installations and hazardous waste repositories (1);

   b) "Accidental pollution" means substantial pollution off-site resulting from an accident in a hazardous installation;

   c) "Operator of a hazardous installation" means the legal or natural person who under applicable law is in charge of the installation and is responsible for its proper operation (2).

The Polluter-Pays Principle

3. According to the Recommendation of the Council of 26th May 1972, on the Guiding Principles Concerning International Economic Aspects of Environmental Policies [C(72)128], the "principle to be used for allocating the costs of pollution prevention and control is the so called Polluter-Pays Principle". The implementation of this principle will "encourage rational use of scarce environmental resources". According to the Recommendation of the Council of 14th November 1974 on the Implementation of the Polluter-Pays Principle [C(74)223], "the Polluter-Pays Principle... means that the polluter should bear the expenses of carrying out the pollution prevention and control measures introduced by public authorities in Member countries, to ensure that the environment is in an acceptable state. In other words, the cost of these measures should be reflected in the cost of goods and services which cause pollution in production and/or consumption". In the same Recommendation, the Council recommended that "as a general rule, Member countries should not assist the polluters in bearing the costs of pollution control whether by means of subsidies, tax advantages or other measures".

Application of the Polluter-Pays Principle

4. In matters of accidental pollution risks, the Polluter-Pays Principle implies that the operator of a hazardous installation should bear the cost of reasonable measures to prevent and control accidental pollution from that installation which are introduced by public authorities in Member countries in conformity with domestic law prior to the occurrence of an accident in order to protect human health or the environment.

5. Domestic law which provides that the cost of reasonable measures to control accidental pollution after an accident should be collected as expeditiously as possible from the legal or natural person who is at the origin of the

accident, is consistent with the Polluter-Pays Principle.

6. In most instances and notwithstanding issues concerning the origin of the accident, the cost of such reasonable measures taken by the authorities is initially borne by the operator for administrative convenience or for other reasons (3). When a third party is liable for the accident, that party reimburses to the operator the cost of reasonable measures to control accidental pollution taken after an accident.

7. If the accidental pollution is caused solely by an event for which the operator clearly cannot be considered liable under national law, such as a serious natural disaster that the operator cannot reasonably have foreseen, it is consistent with the Polluter-Pays Principle that public authorities do not charge the cost of control measures to the operator.

8. Measures to prevent and control accidental pollution are those taken to prevent accidents in specific installations and to limit their consequences for human health or the environment. They can include, in particular, measures aimed at improving the safety of hazardous installations and accident preparedness, developing emergency plans, acting promptly following an accident in order to protect human health and the environment, carrying out clean-up operations and minimising without undue delay the ecological effects of accidental pollution. They do not include humanitarian measures or other measures which are strictly in the nature of public services and which cannot be reimbursed to the public authorities under applicable law nor measures to compensate victims for the economic consequences of an accident.

9. Public authorities of Member countries that "have responsibilities in the implementation of policies for prevention of, and response to, accidents involving hazardous substances" (4), may take specific measures to prevent pollution. Although the cost entailed is as a general rule met by the general budget, public authorities may with a view to achieving a more economically efficient resource allocation, introduce specific fees or taxes payable by certain installations on account of their hazardous nature (e.g., licensing by fees), the proceeds of which to be allocated to accidental pollution prevention and control.

10. One specific application of the Polluter-Pays Principle consists in adjusting these fees or taxes, in conformity with domestic law, to cover more fully the cost of certain exceptional measures to prevent and control accidental pollution in specific hazardous installations which are taken by public authorities to protect human health and the environment (e.g., special licensing procedures, execution of detailed inspections, drawing up of installation-specific emergency plans or building up special means of response for the public authorities to be used in connection with a hazardous installation), provided such measures are reasonable and directly connected with accident prevention or with the control of accidental pollution released by the hazardous installation. Lack of laws or regulations on relevant fees or taxes should not, however, prevent public authorities from meeting their responsibilities in connection with accidents involving hazardous substances.

11. A further specific application of the Polluter-Pays Principle consists in charging, in conformity with domestic law, the cost of reasonable pollution control measures decided by the authorities following an accident to the operator of the hazardous installation from which pollution is released. Such measures taken without undue delay by the operator or, in case of need, by the authorities would aim at promptly avoiding the spreading of environmental damage and would concern limiting the release of hazardous substances (e.g., by ceasing emissions at the plant, by erecting floating barriers on a river), the pollution as such (e.g., by cleaning or decontamination), or its ecological effects (e.g., by rehabilitating the polluted environment).

12. The extent to which prevention and control measures can be considered reasonable will depend on the circumstances under which they are implemented, the nature and extent of the measures, the threats and hazards existing when the decision is taken, the laws and regulations in force, and the interests which must be protected. Prior consultation between operators and public authorities should contribute to the choice of measures which are reasonable, economically efficient, and provide adequate protection of human health and the environment.

13. The pooling among operators of certain financial risks connected with accidents, for instance by means of insurance or within a special compensation or pollution control fund, is consistent with the Polluter-Pays Principle.

Exceptions

14. Exceptions to the Polluter-Pays Principle could be made under special circumstances such as the need for the rapid implementation of stringent measures for accident prevention, provided this does not lead to significant distortions in international trade and investment. In particular, any aid to be granted to operators for prevention or control of accidental pollution should be limited and comply with the conditions set out previously. (5) In the case of existing hazardous installations, compensatory payments or measures for changes in zoning decisions in the framework of the local land use plan might be envisaged with a view to facilitating the relocation of these installations so as to lessen the risks for the exposed population.

15. Likewise, exceptions to the above Guiding Principles could be made in the event of accidental pollution if strict and prompt implementation of the Polluter-Pays Principle would lead to severe socio-economic consequences.

16. The allocation to the person at the origin of the accident or the operator, as the case may be, of the cost of reasonable measures taken by public authorities to control accidental pollution does not affect the possibility under domestic law of requiring the same person to pay other costs connected with the public authorities' response to an accident (e.g., the supply of potable water) or with the occurrence of the accident. In addition, public authorities may, as appropriate, seek compensation from the party liable for the accident for costs incurred by them as a result of the accident when such costs have not yet been paid to the authorities.

Notes

1. Hazardous installations covered by this Recommendation are as defined in the law applicable in the country of the

installation (domestic law and in some instances, European Community law). Countries are not prevented from making provisions under their national laws to the effect that the Guiding Principles also apply to installations excluded under subparagraph 2a of this Appendix.

2. The concept of operator is defined in the law applicable in the country of the installation, in which attention may be given to criteria such as ownership of certain hazardous substances or possession of a license or permit.

3. In cases where a party other than the operator has, under the law applicable in the country of the installation, strict liability for an accident, the cost of reasonable control measures taken by the authorities would be charged to that party, not to the operator. Whenever national laws provide a regime of strict liability, this regime would be applied in respect of the reimbursement of costs of control measures taken after the accident.

4. Concluding Statement of the OECD Conference on Accidents Involving Hazardous Substances, C(88)83.

5. Recommendation of the Council of 14th November 1974 on the Implementation of the Polluter-Pays Principle, C(74)223.

Environment Chapter in the Revised OECD Guidelines for Multinational Enterprises*

(Adopted by the Council on 5th June 1991)

Environmental Protection

"Enterprises should, within the framework of laws, regulations and administrative practices in the countries in which they operate, and recalling the provisions of paragraph 9 of the Introduction to the Guidelines that, inter alia, multinational and domestic enterprises are subject to the same expectations in respect of their conduct whenever the Guidelines are relevant to both, take due account of the need to protect the environment and avoid creating environmentally-related health problems. In particular, enterprises, whether multinational or domestic, should:

1) Assess, and take into account in decision making, foreseeable environmental and environmentally-related health consequences of their activities, including siting decisions, impact on indigenous national resources and foreseeable environmental and environmentally-related health risks of products as well as from the generation, transport and disposal of waste;

2) Co-operate with competent authorities, inter alia, by providing adequate and timely information regarding the potential impacts on the environment and environmentally-related health aspects of all their activities and by providing the relevant expertise available in the enterprise as a whole;

3) Take appropriate measures in their operations to minimise the risk of accidents and damage to health and the environment, and to co-operate in mitigating adverse effects, in particular:

   a) by selecting and adopting those technologies and practices which are compatible with these objectives;

   b) by introducing a system of environmental protection at the level of the enterprise as a whole including, where appropriate, the use of environmental auditing;

   c) by enabling their component entities to be adequately equipped, especially by providing them with adequate knowledge and assistance;

   d) by implementing education and training programmes for their employees;

   e) by preparing contingency plans; and

   f) by supporting, in an appropriate manner, public information and community awareness programmes."

* The Guidelines for Multinational Enterprises are contained in Annex I to The OECD Declaration and Decisions on International Investment and Multinational Enterprises–Basic Texts (OECD, Paris, 1992).

Some Other OECD Publications Related to Chemical Accident Prevention, Preparation and Response

Users Guide to Hazardous Substance Data Banks Available in OECD Member Countries.

Users Guide to Information Systems Useful to Emergency Planners and Responders Available in OECD Member Countries.

International Directory of Emergency Response Centres (OECD Environment Monograph No. 43; UNEP-IE/PAC Technical Report No. 8).

Workshop on Emergency Preparedness and Response and on Research in Accident Prevention, Preparedness and Response (OECD Environment Monograph No. 31).

Workshop on the Role of Public Authorities in Preventing Major Accidents and in Major Accident Land-Use Planning (OECD Environment Monograph No. 30).

Workshop on the Provision of Information to the Public and on the Role of Workers in Accident Prevention and Response (OECD Environment Monograph No. 29).

Workshop on the Prevention of Accidents Involving Hazardous Substances: Good Management Practice (OECD Environment Monograph No. 28).

Accidents Involving Hazardous Substances (OECD Environment Monograph No. 24).

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