
INSTITUTE FOR SYSTEMS ENGINEERING AND INFORMATICS

Support activities for the Directorate-General for Environment, Nuclear Safety and Civil Protection
on the implementation of the Council Directive
on the major accident hazards of certain industrial activities

COMMUNITY DOCUMENTATION CENTRE ON INDUSTRIAL RISK

EC STUDY - LESSONS LEARNT FROM EMERGENCIES AFTER ACCIDENTS IN IRELAND INVOLVING DANGEROUS SUBSTANCES



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1. INTRODUCTION

1.1 OVERVIEW AND SCOPE

Hinton and Higgs (Ireland) Limited were requested by the Commission of the European Communities to conduct a study on emergencies after accidents in Ireland either in process/storage plants or during the transportation of dangerous substances - dangerous substances as defined in the *EC Directive 82/501/EEC (1)* (commonly referred to as the "Seveso Directive"), as amended by *Directive 87/216/EEC (2)*, and as amended by *Directive 88/610/EEC (3)*.

The main objectives of the study are as follows:

- to collate information on the policy and statutory basis of emergency planning and response in Ireland,
- to collate information on relevant accidents which have occurred in Ireland,
- to analyse and evaluate the collated material to determine relevant lessons which may be used to improve emergency planning and response within the EC.

The broad aim of this study is to gather information on emergency planning and response and to enhance communication and understanding on this issue within the European Community.

The scope of this study encompasses emergency planning and response provisions for accidents involving dangerous substances either in fixed installations subject to the requirements of the "Seveso Directive" or during transportation. Accidents involving radioactive substances, the manufacture and storage of explosives, extraction and mining operations, licensed toxic and dangerous waste sites and military installations are outside the scope of this study and therefore are not considered.

The study has two main parts. The first part is a comprehensive review of the policy and statutory framework for emergency planning and response in Ireland. The government policy, statutory requirements and organisations relevant to this issue are detailed. These include the central and local government authorities, emergency services, voluntary services, industry and any other relevant organisations. The complete range of organisations have been included and consulted to provide as wide a scope of information as possible.

The second part of the study focuses on relevant accidents which have occurred in Ireland at both fixed installations and during transportation. Four fixed installations and thirteen transport accidents were deemed suitable for analysis. The accidents are described only in sufficient detail to illustrate the emergency planning and response aspects. The following areas were analysed for each accident:

- Pre-emergency planning,
- Relevant accident descriptions including the emergency services involved and the actions they performed,
- Information dissemination to the public and media,
- Post accident actions,
- Evaluation of the suitability and efficiency of the emergency planning and response during and after the accident.

All the relevant organisations were consulted during the analysis of these accidents. These include relevant Companies, emergency services, government agencies, industrial

representatives and the Central and Local Competent Authorities responsible for the legislation implementing the "Seveso Directive" in Ireland. Therefore, a wide range of opinions in terms of the resulting lessons learnt on emergency planning and response were obtained. In addition, the Central and Local Competent Authorities, emergency services, government and industrial bodies were consulted for their evaluation of the emergency planning provisions in Ireland.

The list of the sources who kindly provided information for this study are detailed in Appendix 3. I would like to take this opportunity to thank all of these people for their time and co-operation.

1.2 EXECUTION OF STUDY

There is no single organisation responsible for emergency planning in Ireland. This responsibility is divided between several organisations. Therefore, all relevant government and non-government bodies involved in emergency planning and response were contacted to inform them of the study and request their co-operation where relevant.

All of the organisations contacted have been very co-operative and provided invaluable information. Meetings have been conducted as required with each relevant body. The organisations have provided a broad range of expert opinions for this study. They have provided information on the:

- policy, legislative and organisational structure for emergency planning and response,
- accidents analysed,
- lessons learnt on emergency planning and response.

The Central Competent Authority responsible for enforcing the Regulations implementing Directive 82/501/EEC in Ireland - the **Health and Safety Authority (HSA)** provided their expert advice on, inter alia, a suitable choice of accidents for analysis.

The information requested from relevant sources was presented in the form of an outline/questionnaire which was customised to suit the responsibilities of each organisation contacted. A generic outline of the information requested is in Appendix 4.

A **Data Collection Form** was developed to present information on the accidents analysed in an "ease-related" format. The form was distributed to relevant organisations and their comments were incorporated.

Finally, the relevant organisations from government, emergency services, industry, etc... have commented on this report to ensure it is an accurate representation of the emergency planning situation in Ireland.

2. POLICY, LEGISLATION, AND ORGANISATION

2.1 INTRODUCTION

The detailed description of the Irish policy, legislative and organisational framework for emergency planning and response is set out as follows:

- Organisation structure
- Policy framework
- Statutory requirements
- Roles played by organisations in emergency planning and response:
 - Pre incident/accident
 - During incident/accident
 - Post incident/accident
- Communication structure:
 - Liaison between organisations
 - Telecommunications
 - Public and media.

2.2 ORGANISATIONAL STRUCTURE FOR EMERGENCY PLANNING AND RESPONSE

2.2.1 Introduction

This section is a brief introduction to the key players in emergency planning and response in Ireland. The specific roles and functions of these organisations will be detailed in Section 2.5

- **Roles played by organisations involved in emergency planning and response.**

2.2.2 Central Government

There is no single organisation responsible for major emergencies involving dangerous substances in Ireland. The responsibility is distributed throughout several organisations with the main activity at a local level. At central government level emergency planning responsibility is spread between the Department of Labour (now known as the *Department of Enterprise and Employment*), the *Department of the Environment*, the *Department of Justice* and the *Department of Health*. Each Department provides guidance and advice on emergency planning to the agencies responsible at local level. Each Department provides guidance for a specific local agency as follows:

- The Department of the Environment advise the Local Authorities,
- The Department of Health advise the Health Boards,
- The Department of Justice advise the Irish police - the Garda Siochana.

The *Department of Transport, Energy and Communications* and the *Department of Marine* are the central government bodies involved in the transport of dangerous substances by road, rail, air and sea respectively.

2.2.3 Central Competent Authority for Directive 82/501/EEC

Directive 82/501/EEC is implemented in Irish legislation by **Statutory Instrument (S.I.) No. 292 of 1986 European Communities (Major Accident Hazards of Certain Industrial Activities) Regulations, 1986 (4)** as amended by **S.I. 194 of 1989 (5)** as amended by **S.I. 21 of 1992 (6)**. The *Minister for Labour* is designated as the Central Competent Authority which is the main enforcement body under the Regulations. Enforcement and inspection under the Regulations is performed by the *National Authority for Occupational Safety and Health*, which is known as the *Health and Safety Authority (HSA)* (hereafter referred to as the HSA). The Health and Safety Authority are a state sponsored body under the aegis of the *Department of Enterprise and Employment*.

2.2.4 Local Competent Authorities

The Local Competent Authorities responsible for local implementation of the off-site planning provisions of the "Seveso Regulations" are as follows:

- the Local Authorities,
- the Health Board,
- the Garda Siochana.

For emergency planning purposes, there are thirty-three Local Authorities in Ireland organised as County Councils and Corporations. The Local Authorities come under the guidance of the Department of the Environment. The Local Authority emergency services include the Fire Services, Environmental Services, Housing and Sanitary Services.

The Health Boards come under the jurisdiction of the Department of Health. They are responsible for the provision of hospital and ambulance services. Ireland is divided into eight regional health boards for the purposes of administration of the health services. The regional health boards are as follows:

- | | |
|------------------------------|----------------------------|
| - Eastern Health Board | North-Western Health Board |
| - Midland Health Board | South-Eastern Health Board |
| - Mid-Western Health Board | Southern Health Board |
| - North-Eastern Health Board | Western Health Board. |

The Garda Siochana are a **national** police service under the guidance of the Department of Justice. There are five Garda Siochana divisions in the Dublin Metropolitan area and eighteen divisions throughout the rest of Ireland.

The main designated emergency services are the Local Authorities, Health Boards and the Garda Siochana.

2.2.5 Other organisations involved in Emergency Planning and Response

An accident involving dangerous substances may require the response and co-ordination of a variety of public, private and voluntary organisations. In addition to those mentioned already these may include Civil Defence, Defence Forces, industrial advisors, specialist experts, utilities (e.g Telecomm Eireann {Irish telephone service}, Electricity Supply Board, Bus Eireann (Irish Bus), Iarnod Eireann {Irish Rail}) and other relevant bodies. The co-ordination of these organisations in emergency planning and response is described in Section 2.5.

2.3 POLICY FRAMEWORK FOR EMERGENCY PLANNING IN IRELAND

2.3.1 Major Emergency Planning

Historically, the Health Boards have played a leading role in Major Emergency Planning in Ireland. This is particularly true of the Southern Health Board which is responsible for emergency planning specifically in the Southern Health Board region of Counties Cork and Kerry. The Southern Health Board developed an "all risks" emergency plan (called the **Major Accident Plan (7)**) which the Local Authority, Garda Siochana and any other relevant emergency services fed into and supported. This plan was tested during several large scale accidents in the Southern Health Board region e.g. the Whiddy Island oil tanker explosion (January 1979) and the Air India aircraft crash off the south west coast (June 1985). During these accidents the activated Plan was found to be effective. As a cumulative result of the industrialised Southern Health Board region and the occurrence of several major accidents in this area, the Southern Health Board Major Accident Plan developed further and those involved in its evolution became specialists in the major emergency planning field.

In 1982 the *Inter-Departmental Committee on Emergency Preparation* was convened to consider the entire issue of major emergency planning in Ireland. This Committee included representatives from the Departments of the Environment, Justice, Health and Defence under the chairmanship of a representative from the Department of the Taoiseach (the department of the Irish Prime Minister).

In 1984 the Committee produced, with government approval, the *Framework for Co-ordinated Response to Major Emergency (8)* which applies to the Local Authority, Health Board and Garda Siochana. The document is designed with a twofold purpose:

- a) to facilitate the preparation of plans by the emergency services and
- b) to ensure a prompt, effective and co-ordinated response by them to a major emergency.

Under the Framework document each emergency service must prepare a Major Emergency Plan (MEP) following the basic structure outlined. These plans must be prepared and maintained such that they co-ordinate with each other.

The framework document defines a "Major Emergency" as:

"any event which, usually with little or no warning, causes or threatens:

- death or injury*
- serious disruption of essential services, or*
- damage to property.*

beyond the normal capabilities of the Garda Siochana, Local Authorities (including fire authorities) and health services".

The scope of the MEP is for "Major Emergencies arising, for example, from fires, explosions, gas releases, transportation accidents, spillages of dangerous substances etc". Emergencies resulting from oil supply crises, electricity blackouts, industrial disputes etc. are of a different nature and are not catered for in this plan. However, the plan recognises that such emergencies may result in a situation e.g. a gas explosion, which may require activation of the MEP.

The Framework document specifies that each Emergency Plan consists of uniform procedures which can be standardised nationally. These procedures are classed under the following headings:

- Area of Operation of Plan

- Activation of Plan
- Response of various services
- Control of Operations (at the site of the emergency)
- Co-ordination (Remote from the site)
- Demobilisation
- Communications
- Press and information
- Identification of emergency services personnel/vehicles.

In addition to the uniform procedures, each Emergency Plan must have documented Pre-Determined Arrangements (PDAs) giving precise details on the response of the particular emergency service to specific incidents and hazards. This section is an adjunct to the emergency plan and must be consistent with it. The PDAs are generally organised as appendices to the MEP.

The Framework document also provides guidance on pre-planning procedures. The following areas are included:

- Assessment of resources, capacity, materials and equipment in stock,
- Specialist advisors
- Assistance from other bodies, Government Departments
- Care of supervisors - Accommodation and food
- Danger area
- Co-ordination (Remote from site)
- Post planning and review.

Specific, precise information relating to each of these areas must be included in the appendices of each MEP. In particular, the Framework states that as part of the pre-planning process, all permanent or temporary risks within or near the area of operation of the plan should be identified and listed. A full appraisal of the resources needed to deal with these risks should be included in an appendix to the plan.

A recommended layout of the site of a major emergency is included in the MEP. Obviously, this is only a guideline and should be customised to suit the accident site. An example of the layout as recommended in the Framework document is illustrated in Appendix 8. Three designated areas are specified in the layout.

- **Holding Area**
- **Control Area**
- **Danger Area.**

On arrival at the site of an emergency each emergency service will report to and be deployed from their specific Holding Area. This area should be inside the perimeter of the incident and well upwind of the incident. The Control Area is where each designated emergency services **Controller of Operations** controls, directs and co-ordinates the activities of the respective services. Each emergency service at the scene of an emergency will have their own Holding and Control Areas. A **Danger Area** is designated where there is a definite risk to rescue personnel because, for example, protective equipment may be required. The senior fire brigade officer following consultation with the other Controllers of Operations decides whether a Danger Area is required and assumes overall control within this area.

The overall emergency response is the MEP which, in turn, is the combined plans of the

respective Local Authority, Health Board and Garda Siochana in the location of the emergency. Plans are prepared by the emergency services responsible for a specified region - called the **functional area**. The plans specify the accepted roles and responsibilities of each service which have been defined and co-ordinated in advance to ensure a comprehensive response. For this purpose the framework document introduced the concept of a **Co-ordinating Group** which was to consist of the City/County manager of the Local Authority, Chief Executive Officer of the Health Board, and the Chief Superintendent of the Garda Siochana, or nominees recommended by them. The Group are responsible for, *inter alia*, meeting once a year to review the arrangements for the co-ordination of the emergency plan and review problems which have occurred during the year.

The Framework stresses co-ordination in preparation and review of the Emergency Plan. Emergency services must know the responsibilities, capabilities and emergency procedures of the other emergency services in their functional area and, where relevant, adjoining functional areas. The procedures in each plan must be "*fully compatible*".

When the Framework was introduced, each Local Authority, Health Board and Garda Siochana division were requested to update and review their emergency plans in relation to the Framework documents. Once guidance is given by any of the relevant Departments or the Inter-Departmental Committee, the Local Authorities, Health Boards and Garda Siochana are responsible for implementation and updates to the emergency planning procedures as required.

As part of the Framework package, the Department of the Environment issued, to the Local Authorities, the "**Local Authority Major Emergency Plan, Model**" (9) as a model specifically for the development of the Local Authority Emergency Plan. Its purpose was:

- a. *"to outline generally the procedures to be followed and the functions to be undertaken by the Local Authority services, and*
- b. *to co-ordinate the procedures to be followed and functions to be undertaken by the Local Authority, with those of the Health Board, Garda Siochana and any other agencies responsible for emergency planning."*

In addition, the Department of the Environment issued to the Local Authorities the **Explanatory Memorandum on the Model Local Authority Major Emergency Plan (10)** and the **Emergency Planning, General Advice and Guidelines (11)**.

As the Health Boards already had developed an emergency plan, their operations in this area were not largely effected by the Framework except to ensure co- ordination of their plan with the other emergency service plans.

In summary, the current situation is that three emergency plans for the three emergency services exist for each functional area in the country and these should be co-ordinated by the designated Co-ordinating Group in each functional area to comprise the MEP for that area.

In Ireland there are 64 Major Emergency Plans as follows:

- 1 for each of the 33 Local Authorities,
- 1 for each of the 8 Health Boards,
- 1 for each of the 18 Garda divisions and,
- 1 for each of the five Garda divisions in Dublin.

In the event of a major emergency, it is intended that at least one of these plans for the respective functional area should be activated e.g. 1 Local Authority plan, 1 Health Board plan and 1 Garda Síochána plan. The Major Emergency Plan for each Local Authority, Garda Division and Health Board for each area respectively are distributed to the respective Local Authorities, Garda division and Health Boards in the corresponding area in addition to other relevant Local Authorities and agencies. This distribution list is included in the MEP.

The Framework is an "*all hazards*" approach to emergency planning and response. It appreciates the need for flexibility in the emergency services approach and that their response may be influenced by unforeseen factors. The model plan states that even though specific procedures have been defined in the plan, initiative and common sense must be used as dictated by the emergency situation.

In 1986 a new *Inter-Departmental Committee on Peacetime Emergency Planning* was established with representatives from the Departments of the Environment, Health, Justice and Defence. This committee was established to consider peacetime emergency planning arrangements including:

- the Framework package,
- exercises conducted to test the MEPs,
- feedback from actual accidents, and
- information from international contacts.

The Committee produced a *Report on Peacetime Emergency Planning (12)* in March 1989. The report concluded that "*in general*" the Framework documentation was "*adequate to prepare local emergency response plans*". However several issues were considered to require "*further consideration at local, and in some cases central, level*". In general, it was recommended that a greater co-ordination between the emergency planning requirements of the individual emergency services should be considered within their normal capital and operational programmes.

Specifically the report makes recommendations on the following aspects of emergency planning and response:

- Activation of the plan,
- Hazard analysis,
- Special equipment,
- Communications with the public and media,
- Exceptional measures,
- Request for any assistance,
- Co-ordination of response,
- Arrangements with the meteorological office,
- Emergency exercises,
- Stockpiling fuel supplies,
- Identification of personnel,
- Information update on emergency planning,
- Information update on emergency planning initiatives at EC level.

This report was distributed to all the major emergency services for their information and, where necessary, to update their emergency plans in accordance with the report.

The Committee functions as an advisory body which provides guidance to the Local Authorities, Health Boards and Garda Siochana on emergency planning. They also make the decisions concerning any changes to emergency planning procedures. Once guidance, advice or decisions are made by the Committee, the relevant Departments advise the local agencies for which they are respectively responsible.

2.3.2 Emergency Exercises

General Advice and Guidelines on *Major Emergency Plans: Planning and Staging an Exercise (13)* were produced in June 1989 by the Department of the Environment.

This document highlights the essential role of emergency exercises in the emergency planning process.

The introduction states that the ability of the emergency services to respond effectively to a major emergency largely depends on:

- *"understanding the major emergency plan,*
- *operating of the plan itself,*
- *ability to work effectively and in co-ordination with all other, agencies responding,*
- *general level of training within each service,*
- *pre-determined arrangements (PDAs) for different services response."*

It stresses how the organisation and staging of emergency exercises provides the ideal opportunity to assess the effectiveness of the MEP in practice. As a result of exercises, deficiencies or potential improvements may be identified and remedied before a major emergency occurs and it is too late. In addition, emergency exercises provide a training opportunity to personnel in which they become familiar with their roles and responsibilities as detailed in the MEP.

The emergency exercise is to be as realistic as possible a simulation of some or all parts of a real emergency. The response taken and action performed must be as for a real emergency. The exercise scenario is generally devised to be the worst possible case.

There are 3 types of exercise:

- Desk Exercise,
- Limited Scale Exercise,
- Full Scale Exercise.

These vary respectively from table top simulations to full scale "on the ground" simulations including the mobilisation and co-ordination of resources and personnel from several different organisations. Simple exercises should be performed initially and on a regular basis. Desk exercises are to be conducted on an annual basis. On culmination of simple exercises a full scale exercise may be worked up to.

Sufficient planning must be conducted before the exercise. Specific provisions for this include:

- Scenario and narrative
- Location/site
- Observers/umpires
- Safety
- Timescale
- Refreshments.

Pre-planning of the exercises is highlighted as an important aspect. Pre-exercise seminars maybe conducted if required, to fully familiarise all participating personnel with the procedures of the MEP, their role and the objectives of the exercise.

Additional considerations as follows are considered in the guidelines:

- secrecy,
- level of response to exercises,
- identification of personnel,
- dealing with the media,
- maintenance of a log,
- liaison and co-operation between controllers,
- liaison and co-operation of the co-ordinating groups.

A number of sample narratives are included in the guidelines for simple and more detailed scenarios. Sample expected responses are also included which may be used in monitoring the exercise. It is recommended that expected responses are drafted for each exercise.

One of the sample scenarios of particular interest to this study is for a chemical leak. This scenario was developed by the U.S. Federal Emergency Management Agency (FEMA) and has been suitably adapted by the Department of the Environment. This scenario may be tailored for use as a simple through to full scale exercise. A copy of this is included at Appendix 5.

On issue of the General Advice and Guidelines document the Local Authorities were encouraged to establish a major emergency exercise programme if such a programme had not already been initiated.

Feedback from Major Emergency Planning exercises held in Ireland and abroad were produced in the *Memorandum on Emergency Planning and Emergency Exercises (14)* issued in September 1992. This memorandum considered matters requiring particular attention in emergency plan preparation and emergency exercises. All Local Authorities were requested to review their MEPs and exercise provisions based on this memorandum.

As an example of an emergency exercise, a recent full-scale exercise was conducted at Aughinish Island in County Limerick. The scenario involved an aircraft which develops engine trouble off the Irish coast. On its approach to Shannon airport, an engine falls off and hits part of an industrial installation resulting in a major release of caustic and the rupture and fire of a heavy fuel oil storage tank. Additional fires are caused by falling debris in a part of the installation under construction and used by contractors. The realism of a scenario is often a limitation in exercises. An example of some of the practical provisions used to make the scenario as realistic as possible include: the provision of suitable props; fifty "casualties"; a passenger manifest which co-ordinated with the casualties hospital charts detailing a variety of injuries from broken bones to thermal burning; telephone calls were organised to bombard the emergency services, government departments, hospitals, airport etc...as would be the case in a real emergency; and the transport by civilian volunteers of the initial less seriously injured casualties to hospital in private cars as this is sometimes how hospitals first become aware of a major emergency.

2.4 STATUTORY BASIS FOR EMERGENCY PLANNING AND RESPONSE IN IRELAND

The Major Emergency Planning Framework in Ireland is a policy framework and is not

implemented by legislation. The policy has evolved on the basis of experience to suit emergencies relevant to Ireland and reflects the administrative system and mechanism for handling accidents. To date, the main activity on Major Emergency Planning, with the exception of the legislation implementing Directive 82/501/EEC and its amendments, has been undertaken by the major response agencies in accordance with government departments.

2.4.1 Irish Legislation Implementing Directive 82/501/EEC

As stated in section 2.2.3 the legislation implementing Directive 82/501/EEC in Ireland is *S.I. No. 292 of 1986 European Communities (Major Accident Hazards of Certain Industrial Activities) Regulations, 1986*, as amended by S.I. 194 of 1989 and as amended by S.I. 21 of 1992 (hereafter referred to as the "Seveso Regulations").

In addition to the legislation, the previous Department of Labour (now the Department of Enterprise and Employment) issued a *Guide to European Communities (Major Accident Hazards of Certain Industrial Activities) Regulations, 1986 (15)*. In addition, the Department of the Environment has issued *The Seveso Directive - Emergency Planning Guidance Notes for Local Authorities on the European Communities (Major Accident Hazards of Certain Industrial Activities) Regulations, 1986 (16)*.

The "Seveso Regulations" apply to industrial activities where there is or may be involved dangerous substances as defined in Annex II, III or IV of Directive 82/501/EEC.

The Regulations have application at two levels - general and specific requirements. The general requirements apply to all industrial activities covered by the Regulations. The specific requirements apply only where the quantities of dangerous substances exceed specified thresholds.

In Ireland there are 250 installations subject to the general requirements of the Regulations and approximately 21 installations subject to the specific requirements (on-site, off-site plans and information for the safety of the public).

2.4.1.1 General Requirements

The manufacturer has the general duty to prevent major accidents occurring in the establishment and to limit the consequences of such accidents to man and the environment. To do this Regulation 10 specifies these duties as follows:

- i Identification of all major accident hazards:
 - identification of each dangerous substance on site,
 - the maximum quantities involved,
 - their location and use,
 - the possible release pathways which could result in a major accident.
- ii Adoption of appropriate safety measures.
- iii Provision of information, training and equipment to ensure the safety of persons working at the site.

This information should include:

 - Steps taken to ensure people on site are informed of the major accident hazards;
 - Steps to ensure staff have been appropriately trained and that any special protective

equipment such as fire fighting equipment or breathing apparatus (BA) etc. has been provided. The range of information and training provided for staff at different levels of responsibility should be indicated.

- iv Use the Best Practicable Means (BPM) to prevent major emissions of dangerous substances and to render them harmless.
- v Notify the HSA as soon as a major accident occurs and supply necessary details to them.

2.4.1.2 Specific Requirements

For industrial activities and isolated storage where dangerous substances are involved at a specified amount, more specific requirements apply. These include:

- a) Notification of the industrial activity to the HSA,
- b) On-site emergency plan,
- c) Off-site emergency plan,
- d) Information for the safety of the public.

a) Notification of industrial activities

Pursuant to Regulation 12, manufacturers must notify the HSA of their industrial activities using a written notification. According to the Department of Labour guide to the Regulations, the information in the notification is divided into two broad areas:

- i) factual information about the establishment, its activities and location, and
- ii) reasoned arguments and conclusions as to the nature, likelihood and scale of potential major accidents at the site and the provisions set up to prevent them and limit their consequences.

The notification contents includes information under the following headings:

- name, address of establishment and registered business,
- identity of the substance and brief indication of the hazards,
- brief description of the hazards created by the substances to man and to the environment,
- stage of the activity in which the substances are/maybe involved,
- chemical and physical behaviour of substances under normal, relevant working conditions,
- other substances which could effect the potential hazards,
- information relating to the establishment,
- information on the management of the industrial activity,
- information relating to possible major accidents.

The specific requirements for the notification are detailed in Appendix 6 (a).

The guide suggests that the sources of the information will include the following:

- data of a process engineering nature, including hardware specification,
- data of an organisational nature (procedure, operating instructions, maintenance procedures etc.),
- the hazard identification and evaluation techniques used by the manufacturer.

Regulation 13 specifies a report to be produced relating to the notification. Notifications must

be updated every three years and also before modifications which may have an impact on the major accident hazards.

If the notification on reports submitted are inadequate, the HSA may request the details to be investigated.

b) On-site emergency plan

Under regulation 15 it is the duty of the manufacturer to prepare an on-site emergency plan. This plan should include:

- details of how major accidents will be dealt with on-site,
- names of persons authorised to take action,
- names of persons responsible for safety,
- names of those to provide expert advice to the Local Competent Authorities in an accident.

When preparing this plan the manufacturer must consult with all appropriate persons including the Local Competent Authorities. This plan must be reviewed and updated as necessary.

c) Off-site emergency plan

Regulation 16 specifies that it is the function of the Local Competent Authorities upon notification from the HSA of a relevant industrial activity, in their functional area to prepare an off-site emergency plan. This is an emergency plan for dealing with the effects of a major accident outside the installation. The HSA notifies the relevant Local Competent Authorities using a format similar to the initial site notification detailed in Appendix 6(a).

The Local Competent Authorities have nine months to prepare the off-site plan. They must consult with the manufacturer to obtain the required information for preparation of the plan. They also consult with the HSA to ensure that duplication of information requested from the manufacturers is avoided. The Local Competent Authorities have the right to information from the manufacturer relevant to the nature, extent and likely effects off-site of a major accident. The manufacturer has one month to provide any requested information. If it is not provided or is inadequate the Local Competent Authority may request the information from the HSA who, in turn, have the power to obtain relevant information which is not already available from the manufacturer.

In preparation of the off-site plan each Local Competent Authority must consult with the following agencies:

- the other Local Competent Authorities in the functional area and adjacent functional areas if relevant,
- the manufacturer,
- the HSA,
- any additional relevant organisations e.g. agencies dealing with meteorological data, transport, environmental issues, agricultural issues, temporary food and accommodation, harbour authority etc...

In addition, the consultation process must ensure co-ordination between the off-site plan, on-site plan and the information to be provided to the public. The manufacturer must be informed of the final co-ordinated off-site plan. The off-site plan must be reviewed and updated as required.

The information to be included in the off-site plan is as follows:

- details of how major accidents will be dealt with outside the establishment,

- details of coordination with other local authorities in the event of an accident,
- names of those persons and their deputies authorised to implement and control the off-site emergency plan.

d) Information for the safety of the public

The Regulations require that persons other than those working at the establishment who live and work in the vicinity of an installation subject to the specific requirements of the Regulations and are likely to be effected by a major accident should be informed as follows:

- that the industrial activity has been notified to the HSA,
- the nature of the major accident hazard,
- safety measures and correct action to be adopted in the event of an accident.

The specific information to be included in the information package is detailed in Appendix 6(b).

The HSA guidelines recognise the following three groups within the general public as particularly relevant:

- i) Members of the public who live in or are likely to be in the relevant vicinity of the installation. They particularly note those in schools, hospitals etc. The Health Board are currently working on making provisions for specific risk groups such as the disabled and immobile.
- ii) People working in other industries in the vicinity of the installation.
- iii) Persons with specific duties to perform in the event of an emergency e.g. Local Competent Authorities emergency services.

The recommended methods of information dissemination for the first group include the post, leaflets, notices, local papers and other methods to ensure the maximum target audience in homes are reached. For those travelling by car, bus etc. during an emergency, methods such as notices supported by flashing beacons are suggested.

It is the manufacturers responsibility to provide this information although the manufacturer has the option of arranging an agreement such that the Local Competent Authorities will provide the information. However, research indicates that this option has never been used.

Any relevant provisions of the off-site plan should be considered in doing so. This information should be prepared without the persons concerned requesting it and should be available to any person on request.

The HSA guide to the Regulations stress that the information should be provided as a precautionary measure to prepare the public for possible major accidents and should not be provided only when things go wrong.

2.4.1.3 Notification of a Major Accident

A major accident is defined as *an occurrence such as a major emission, fire or explosion resulting from uncontrolled developments in the course of an industrial activity, leading to a serious danger to man or the environment and involving one or more "dangerous substances"* (as defined in the Regulations).

Pursuant to Regulation 21, the manufacturer must inform the HSA when a major accident occurs. They must include information as follows:

- circumstances of the accident,
- the dangerous substances involved,
- data available for assessing the effects of the accident on man and the environment,
- emergency measures taken,
- steps envisaged to alleviate any short/long term effects of the accident and prevent any recurrence.

The HSA should provide the Local Competent Authorities with the necessary information on the accident so they can review their off-site plans. Other persons having information on the occurrence/analysis of the accident should provide it on request to the HSA.

Under Regulation 22, if the plant (whole/part) is deemed by the HSA to have caused the accident, the HSA require the manufacturer to examine and report to the HSA. This report should include:

- the name and qualifications of persons conducting the examination, manner in which it was carried out, and method used in making tests
- any defect accounting for the incident,
- other matters as specified by the HSA.

Under Regulation 23 when an accident occurs the HSA may get an inspector to make a *Special Report* on the accident or part of it. The HSA may make this available to the Local Competent Authority and may decide to make it public.

Under Regulation 24, the HSA has the power to direct a "*formal investigation*" into:

- the causes and circumstances of the accident, and
- alleged failure of the Local Competent Authority to perform its required functions.

The investigating tribunal are appointed to direct the investigation and report to the HSA.

Under Regulation 25 an inquest must be done in case of death.

Under Regulation 26, when a "notifiable incident" (as defined in the 8th Schedule of the Regulation) occurs the manufacturer must inform the HSA. The manufacturer must keep a register including information as detailed for notification of a major accident under Regulation 21b. The information on this register must be kept for at least 10 years after the incident.

2.4.1.4 Confidentiality

There are specific provisions in the Regulations to protect the confidentiality of specified information given by the manufacturer to the Central and Local Competent Authorities.

2.4.2. The Major Emergency Plan and the "Seveso Regulations"

The Major Emergency Plan Framework is intended to comply with the "Seveso Regulations" and to provide a basis for preparation of off-site emergency plans. As described in 2.4.1 above, the HSA notify the Local Competent Authorities of the existence of an installation subject to the provisions of this Regulation, which is located in their functional area. Each Local Competent Authority must prepare an off-site plan relevant to their specific service.

They communicate with each other during preparation of the plans so that an integrated approach is achieved. The off- site plans should be co-ordinated with the on-site plan prepared by the manufacturer. All the plans should co-ordinate such that they are complementary parts of a single overall plan which will be the basis for the response to a major accident, in line with the provisions of the MEP.

In most cases, the emergency planning provisions required under the Seveso Regulations" would form an appendix to the MEP or a separate plan which is cross referenced to the MEP. The respective installation(s) are listed in the appendix of the MEP with the required information relating to emergencies in each of the installations.

In addition, other hazardous (non-Seveso) installations to which the plan applies are listed in an appendix to the plan.

2.4.2.1 The Cork Emergency Planning Group

In order to implement the Local Competent Authority requirements under the Seveso Regulations" within their functional area, the Southern Health Board formed the ***Cork Emergency Planning Group***.

This group consists of representatives (at operational level) from the Local Competent Authorities relevant to the functional area and has approval and consultation from the HSA.

Within the functional area consisting of counties Cork and Kerry there are six installations which are subject to the provisions of the Seveso Regulations". The purpose of the Group was to enable the relevant Local Competent Authorities, as a group, to consult with each of the six manufacturers individually about relevant aspects of the on-site plans, off-site plans, information to the public and to ensure integration of the three as necessary. It was considered that this approach was more effective both in terms of non-duplications of information and co-ordination, rather than each Local Competent Authority meeting separately with each manufacturer.

The Group annually checks the information package available to the public and ensures it is distributed regularly. A review of the requirements under the Regulations has recently commenced in the region and the six manufacturers have been requested to resubmit copies of their on-site plans and information packages, to the group. After review the group will discuss their findings with the manufacturers individually.

2.4.3 Safety, Health and Welfare at Work Act, 1989

The general safety and health provisions of the ***Safety, Health and Welfare at Work Act, 1989 (17)*** and ***Safety, Health and Welfare at Work (General Applications) Regulations, 1993 (18)*** are relevant to emergency planning and response. While this legislation does not deal specifically with dangerous substances, it deals with the duties of the employer to ensure the health and safety of employees. These duties are proactive accident prevention measures. In particular the following duties are included:

- risk assessment of risks to safety and health at work,
- proactive and preventative measures,
- emergency procedures e.g. emergency provisions for evacuation, equipment, training, first aid and medical resources etc..
- information on the health and safety at work e.g risks, proactive and preventative

- measures, emergency procedures, notified accidents and dangerous occurrences,
- training on relevant health and safety issues.

Pursuant to Part X of the Regulations, the HSA must be notified of accidents and dangerous occurrences in the work place as follows:

- work accidents causing the death of an employee,
- work accidents preventing an employee from working for more than three days,
- an accident caused by a work activity which causes the death of, or requires medical treatment to, a person not at work.

Dangerous occurrences relevant to dangerous substances which must be notified include:

- explosion or fire,
- escape of substances,
- incidents occurring from the transport of substances by road,
- failure of breathing apparatus,
- failure of a freight container.

2.4.4 Transportation of Dangerous Substances

The transport of dangerous chemical substances in Ireland is regulated and controlled by specific statutory provisions.

The international arrangements applicable to the transport of dangerous substances in Ireland are as follows:

- Rail - RID
- Road - European Agreement concerning the International Carriage of Dangerous goods by road (ADR) (in the process of implementation)
- Air - International Air Transport Association (IATA), International Civil Aviation Organisation (ICAO)
- Sea - International Maritime Dangerous Goods Code (IMDG)

The main legislation controlling the conveyance of dangerous substances in Ireland is the **Dangerous Substances Act 1972 (19)** and the Regulations made under it. The Act provides that those engaged in, amongst other things, the conveyance of dangerous substances must take all practical steps to prevent risk of injury to persons or property.

Pursuant to the **Dangerous Substances Act, 1972 (Part IV Declaration) Order, 1980 (20)** a list of twenty five substances were listed in a schedule as dangerous. S.I. No. 236 of 1980 was revoked by the **Dangerous Substances Act, 1972 (Part IV Declaration) Order (21), 1986** which declared a wide range of substances as dangerous, included in which are most of the classes within the scope of the ADR.

2.4.4.1 Road Transport

The following regulations cover the conveyance of the Scheduled Substances declared dangerous under the Dangerous Substance declaration orders 1980 and 1986 respectively:

- **Dangerous Substances (Conveyance of Scheduled Substances by Road) (Trade or Business) Regulations, 1980 (S.I. No. 235 of 1980) (22)**

- **Dangerous substances (Conveyance of Scheduled substances by Road) (Trade or Business) (Amendment) Regulations, 1986 (S.I. No. 268 of 1986) (23).**

These Regulations are enforced by the HSA who in co-operation with the Garda Siochana carry out regular road checks as part of the enforcement procedure.

These Regulations apply to dangerous goods of a specified quantity and transported only for business or trade purposes. Only those goods permitted under the ADR may be transported. The carrier of the dangerous substances must obtain a certificate (Transport Document) for each load from the consigner identifying the substances carried and detailing the emergency procedures in the event of a mishap. The contents of the certificate is detailed in Appendix 7 (a). Transport Emergency Cards (Tremcards) published by the European Council of Chemical Manufacturers Federation (CEFIC) may be used to fulfil part of the certification requirements, as described in Appendix 7(a). In Ireland the text of Tremcards is available from the Federation of Irish Chemical Industries (FICI). The Tremcard should be attached to the certificate to comply with the Regulations.

The labelling and packaging of dangerous substances should follow the provisions specified in either:

- the ADR, or
- the **European Communities (Dangerous Substances) (Classification, Packaging and Labelling) Regulations 1979 (24)** as amended in 1980, 1983, 1984, 1986, and 1988,
- the **European Communities (Dangerous Substances) (Classification, Packaging, Labelling and Notification) Regulations 1982, as amended in 1985 (25),**
- the **European Communities (Dangerous Preparations) (Solvents) (Classification and Labelling) Regulations 1983 (26),**
- the **European Communities (Classification, Packaging and Labelling of Pesticides) Regulations, 1983 (27)**
- IMDG Code (IMO).

Vehicles carrying scheduled substances or their residues must display plates and labels as required under the ADR. The Regulations also allow the use of other signs approved by the Minister of Labour. The UK hazard information system (UKHIS), commonly called Hazchem, has been approved for the conveyance of scheduled substances in tanks and tank containers only. When conveying dangerous goods in packages only, the ADR plates are used. Labels on individual packages must comply with EC Classification, Packaging and Labelling (CPL) legislation.

The Southern Health Board produce an Emergency Services Hazcard for use by the emergency services and other relevant bodies. The Hazcard illustrates the following labelling and identification systems used in Ireland:

- Hazard Warning Labels
- HAZCHEM
- ADR/RID Identification Labels
- EC Package Labelling System.

A copy of the Hazcard is located in Appendix 7(b). A recent development in the distribution

of Hazcards is to include labelling information in the Automobile Association (AA) drivers handbook. The aim of this is to make the motorist aware and able to identify vehicles transporting dangerous substances.

As part of the implementation of ADR in Ireland, the Directive 89/684/EEC on driver training has been implemented by the *European Communities (Vocational training of drivers of vehicles carrying Dangerous Goods) Regulations 1992 (28)*. The HSA approve the associated driver training courses and assist the Department of Transport, Energy and Communications in conducting the associated examinations.

2.4.4.2 Rail Transport

In Ireland there are three main rail routes transporting dangerous chemical substances. These are as follow:

- a) Methyl acrylate and Acrylonitrile are transported from a Dublin port to Ballina (County Mayo) train station and then by road to its destination in Killala (County Mayo).
- b) Anhydrous ammonia is transported from Cobh (County Cork) to Arklow (County Wicklow).
- c) Petrol is transported from Dublin to Sligo.

The transport of dangerous chemical substances by train is controlled and regulated by special rules and procedures. Tankers, tank containers or freight containers are fitted with appropriate labels as follows:

- a) the appropriate RID hazard label (equivalent to the U.N. labels identifying risks, e.g. inflammable, toxic etc.)
- b) Kemler' plate as defined under the European Marking System (ADR).
- c) Hazchem labels.
- d) Tremcards

In addition, train crews are provided with emergency equipment and carry Tremcards.

The emergency planning and response provisions for the transport of dangerous substances by rail are catered for by the procedures laid down in the following documents:

- a) *Scheme for Alert and Co-ordination of Emergency Services (and other Organisations) in the Event of an Incident/Accident involving Dangerous Substances in Transit by (a) Rail, or (b) a Combination of Rail and Road or (c) Portal Tramway (or Uncleaned Tank Cars, Tank Containers, or other Receptacles which had Contained such Substances) (29)*
- b) Major Emergency Plans for all relevant emergency services.

The scheme and the Major Emergency Plans are co-ordinated and reference each other. The scheme is designed to ensure no conflict between the emergency services response.

The scheme was developed by the *Inter-Departmental Committee dealing with the Transportation of Hazardous Substances by Rail*. The committee members are representative of all the appropriate organisations as follows:

- i Government Departments
 - Department of Transport, Energy and Communications
 - Department of Defence

- Department of the Environment
- Department of Health
- ii Emergency Services in regions relevant to the train routes:
 - Garda Siochana
 - Health Boards
 - Local Authorities
- iii Iarnrod Eireann (Irish Rail)
- iv HSA
- v Relevant Manufacturers/users
- vi Dublin Port and Docks Board.

The scheme and its interaction with the relevant MEPs has been tested on a number of occasions by both field and desk top exercises involving all the relevant organisations. The provisions are reviewed as necessary based on feedback from exercises, incident/accidents and experience from international incidents and policies.

The Garda Siochana divisions relevant to the train routes have developed specific plans detailing the logistical provisions for gaining access to each mile of railway track along each route. Therefore, in the event of an emergency, once the location of the incident is established, the access route to the nearest mile is readily available. These plans cross refer to the MEP.

All relevant emergency services are aware of the scheduled train times for dangerous goods transport. In the event of a large public gathering (e.g. football match) in the vicinity of the train route, the trains are rescheduled to avoid the area and the emergency services are informed.

Pursuant to the *Railway Regulation Act 1871*, all incidents/accidents involving trains carrying dangerous substances must be notified to the Minister for Transport, Energy and Communications. Under this Act, inspections may be authorised for any railway accident and formal investigations for serious accidents are provided for.

There have been no accidents involving the rail transport of dangerous chemical substances requiring formal investigations. Minor incidents/accidents have been investigated by appointed inspectors, but none of these resulted in any significant loss/damage.

2.5 ROLES PLAYED BY THE ORGANISATIONS INVOLVED IN EMERGENCY PLANNING AND RESPONSE

This section is to summarise the roles played by specific organisations throughout the emergency planning and response lifecycle e.g.

- pre-incident/accident
- during incident/accident
- post incident/accident.

2.5.1 Central Government

The Departments of the Environment, Health, Justice and Defence are part of the Inter-

Departmental Committee on Peacetime Emergency Planning and as such determine emergency planning policy at central government level. This Committee monitors and advises as necessary on co-ordinating emergency planning arrangements at national level to facilitate the response of the emergency services. Individually, the departments function in an advisory capacity to guide the emergency planning provisions of the Local Authorities, Health Boards and Garda Siochana respectively with respect to major emergency planning and their requirements under the "Seveso Regulations".

In terms of rail transport of dangerous substances, these departments, in addition to the Department of Transport, Energy and Communications, the emergency services, HSA, industrial manufacturers and the port and docks board form the Inter- Departmental Committee dealing with the Transportation of Hazardous Substances by Rail. The Department of Transport, Energy and Communications and the Department of the Marine are respectively involved in the policy and legislation development associated with the transport of dangerous substances by road and sea respectively.

2.5.2 Central Competent Authority - HSA

The **Process Industries Unit** within the **Specialised Services Directorate** of the HSA deals with, inter alia, the prevention and control of major accidents and the enforcement of the "Seveso Regulations" in Ireland.

As the Central Competent Authority implementing the "Seveso Regulations" the functions of the HSA are as follows:

- i Examination and processing of notifications for installations subject to the regulations,
- ii Notify Local Competent Authorities of the existence of relevant installations in their functional areas, consult with the Local Competent Authorities and ensure, if requested, that the information required to prepare an off-site plan is provided,
- iii Checking off-site plans,
- iv Be notified by the manufacturer of a major accident occurrence as specified in Regulation 21 and supply information to the local Competent Authority as they require to review their off-site plans.
- v In the event of a major accident occurrence, the HSA may require the manufacturer to have a report of the plant prepared if any plant may have caused the accident or a report may be obtained from a HSA inspector and made available to a Local Competent Authority.
- vi Appoint inspectors with power of entry to an industrial activity to inspect and request information.

In terms of enforcement, the Competent Authority have the power to issue prohibition notices, notices specifying certain requirements to be met and obtain court orders. Substantial fines and prison sentences are also provided for in respect of breaches of the Regulations.

Also within the Specialised Services Directorate is the **Dangerous Substances Group**. This group monitors, enforces and advises on application of the Dangerous Substances Act 1972 and the various Regulations made under it relating to retail and private petroleum stores, petroleum bulk stores, oil jetties, the conveyance of dangerous substances and the storage of liquefied petroleum gas.

The HSA is also the Competent Authority responsible for implementing Directive 88/379/EEC on the Classification, Packaging, Labelling and Notification of Dangerous Substances and for the approval of training courses for drivers of vehicles carrying dangerous goods as specified under ADR.

Both the Process Industries Unit and the Dangerous Substances Act Group were consulted with respect to the fixed installation and transport accidents analysed in this study.

2.5.3 Local Competent Authorities

Pre-Incident

Each Local Competent Authority in each functional area prepares a Major Emergency Plan and where installations subject to the specific requirements of the "Seveso Regulations" exist, an off-site plan for each site. These plans are co-ordinated during preparation to ensure an integrated, effective response to a major emergency by the Co-ordinating Group. Training for the emergency services is provided as required. Desk top and field exercises are performed to test the plans with representatives from all Local Competent Authorities taking part as relevant. The emergency plans are updated based on feed back from exercises, incidents/accidents in Ireland and abroad and to account for any changes/modifications which may effect the emergency planing and response procedures.

During Incident/Accident

The response of the emergency services to a "major emergency" involving dangerous substances is dictated by either:

- the Major Emergency Plan and off-site plan (for "Seveso" installations)
- the Major Emergency Plan (for road transport accidents)
- the Major Emergency Plan and the Scheme (for rail transport accidents)

In terms of their response to a major emergency, each Local Competent Authority has specific roles as detailed in the overall Major Emergency Plan provisions and in their individual pre-determined arrangements. Each emergency service carries out their functions in accordance with these provisions and arrangements. The specific emergency services do not have responsibility for services not under their control. Each emergency service must ensure they are adequately prepared to discharge their functions. The specific functions of each of the Local Competent Authorities as determined in the major emergency framework are detailed below:

A. Local Authority

The Local Authority shall carry out the following functions:

1. activation of this plan,
2. extinction of fires,
3. containment, neutralisation and clearance of chemical spills and emissions,
4. protection and rescue of persons and property,
5. maintenance of local authority services (e.g. roads, fire cover, protection of water supplies) during the emergency,
6. provision of access to the site of the emergency, (securing the site and control of access is a function of the Garda Siochana),

7. forensic support for Garda Siochana,
8. advice on evacuation,
9. accommodation and welfare of evacuees and persons displaced by the emergency,
10. site clearance, demolition, clear-up operations, removal and disposal of debris, (this should be done in consultation with Garda Siochana to avoid the possible unnecessary destruction of evidence.),
11. provision of food and rest facilities for personnel responding to the emergency,
12. control and direction of activities of all agencies within the Danger Area" at an emergency,
13. participation in the Co-ordinating Group.

B. Health Boards

The Health Board shall carry out the following functions:

1. activation of this plan,
2. provision of all health services,
3. provision of medical advice and assistance,
4. assessment of casualties and determination of priorities for their evacuation,
5. casualty evacuation and ambulance transport,
6. certification of the dead and provision of forensic support for the Garda Siochana,
7. provision of first aid together with basic life support and treatment at the scene if required,
8. provision of hospital treatment including psychiatric assistance,
9. provision of community, medical and welfare services,
10. participation in Co-ordinating Group.

C. Garda Siochana

The Garda Siochana shall carry out the following functions:-

1. activation of this plan,
2. maintenance of law and order,
3. evacuation,
4. traffic and crowd control,
5. preservation of scene and collection of evidence, (precedence should only be given to this activity where it will not interfere with activities of agencies responding to an emergency which are concerned with the protection of life and the prevention and treatment of casualties.
6. arrangements in respect of the dead,
7. provision of a casualty information service at the site,
8. establishment at the site of an information centre for use by the agencies responding to the emergency,
9. request Telecom Eireann to provide an emergency telephone service, if necessary, in accordance with pre-determined arrangements,
10. securing the site and layout thereof and controlling access thereto,
11. exercise of certain local authority functions pending a local authority response to an emergency, (the Senior Garda Officer on site is empowered to exercise local authority functions pursuant to Section 27 of the Fire Services Act, 1981.),

12. informing the public as necessary and on the advice of the competent authorities of actual or potential dangers arising from the emergency,
13. participation in the Co-ordinating Group.

At the scene of an incident/accident involving dangerous substances the emergency services approach the scene as detailed in their emergency plans. The information available at the scene is used to identify the dangerous substance involved and the response to be taken is determined by access to systems such as Chemdata and/or expert advice. All the Local Competent Authorities have access to chemical databases e.g. Chemdata, either on-line or in manuals. Several divisions of the Local Competent Authorities have portable facilities. All emergency services carry information as detailed in the Hazcards. In addition, the Garda Síochána and fire services use an **Emergency Response Guidebook: Guidebook for Initial Response to Hazardous Material Incidents (30)** which provides information on potential hazards and the appropriate action to be taken for a wide variety of dangerous substances. All measures are taken to avoid environmental degradation resulting either from a dangerous substance spillage as well as the clean up operation. As required, the Local Authority Environmental Services are called to determine whether any environmental damage has occurred as a result of the dangerous substances spillage or the clean up.

2.5.4 Industry

Federation of Irish Chemical Industries (FICI)

FICI represents a wide variety of industries based mainly on chemicals and operates on the basis of four Industry groups: Pharmaceutical and Health, Chemical, Cosmetics, Toiletries and Household Maintenance Products and Agricultural Chemicals. FICI plays a pro-active role both in the prevention of accidents involving chemical substances and the emergency response to them.

As part of the *Responsible Care Programme*, FICI members are active in the establishment of industrial practices which protect the health and safety of employees, customers, the public and the environment. As part of this programme investigations, reporting and follow-up procedures are initiated after an accident. The Federation are currently developing a format to disseminate information on any accidents at FICI sites and the lessons learnt from them to the other Companies within the Federation.

In terms of the transport of dangerous substances, FICI have produced a publication entitled *Code of Practice for the Transport of Hazardous Chemicals by Road (1985 and 1993 versions) (31)* for all FICI members.

FICI, in conjunction with the Department of the Environment, has devised a new, coordinated and markedly improved *Emergency Response Scheme*. The Scheme provides for voluntary assistance to the emergency services by strategically located participating chemical companies having a range of technical resources, throughout the country. Under the Response Scheme, the Emergency Services will be assured of a structured response by the best available expertise, closest to the scene of an accident, so as to optimise the assistance which the industry can provide to the emergency services. The Scheme applies to all road incidents involving the products of participating chemical suppliers and as such will cover the majority of hazardous substances currently transported on Irish roads.

The Manufacturer:

The manufacturer at an installation subject to the specific requirements of the Seveso Regulations" is responsible for notifying the HSA, preparing an on-site plan and providing the required information to the Local Competent Authorities to enable preparation of the off-site plan. In addition they must provide an information package for the safety of the public in the vicinity of the site. The manufacturers must consult with the Competent Authority and Local Competent Authorities as required to ensure the co-ordination of the on-site plan, off-site plans and information package. Transporters of dangerous substances must ensure they meet the legislative requirements set out in section 2.4.4.

During the incident, the manufacturer decides the necessary initial response, activates their emergency plans including the on-site plan if necessary and co-operates with the emergency services. Specified personnel must be available to provide their expertise if required during the emergency response. In the MEP specific provisions are detailed to contact these experts and where relevant, accompany them to the accident scene. In regions with installations subject to the Seveso Regulations" or chemical rail transport, the emergency services have good communications with the manufacturers and are acquainted with them. Many of the larger industrial sites have their own emergency fire brigade which will be activated if required.

2.5.5 The Irish Marine Emergency Service

The Irish Marine Emergency Service (IMES) is a division within the Department of the Marine directly responsible for handling marine emergencies - including those involving dangerous substances. IMES assumes direct responsibility for maritime safety, rescue, shipwreck, sea and coastal pollution. In the event of an emergency the aims of IMES in order of priority are:

- Search and Rescue,
- Counter pollution,
- Salvage.

IMES use the C-Bell (Dutch system) information systems and the Hazchem labelling systems as required, for accidents involving dangerous substances.

IMES have developed their own major emergency provisions, which is structurally similar to the MEP framework.

One of the groups within IMES are the Marine Pollution Response Team (MPRT). MPRT are available should a major pollution incident occur, involving the spillage of oil, chemicals or dangerous substances at sea which threatens the pollution of the Irish coastline. IMES and MRPT work closely with each other. The MPRT meet regularly to discuss relevant matters such as training, technology updates, accident responses, counter pollution equipment etc.

MPRT are also available to provide advice and assistance to the Local Authorities with respect to the on-shore cleaning of oil, chemical and dangerous substances pollution.

2.5.6 Poisons Information Centre, (e.g. Beaumont Hospital, Dublin)

The centre provides information on poisons including drugs, household and industrial chemicals. In the event of an incident/accident the information centre is available to provide information on exposure to dangerous substances, treatment required and appropriate

procedures to adopt. They would be listed as an information source for poisons denoted in the emergency plans of organisations.

2.5.7 Other Relevant Organisations

Additional relevant agencies who may play a role in the response to a major emergency are referenced as required in each MEP. The groups may include Local Competent Authorities in an adjacent functional area, utilities, etc. This reference maybe in the form of a contact number/location or a reference to emergency provisions specified by the agency. The following organisations may be included in this context:

Army	Irish Marine Emergency Service
Civil Defence	Meteorological Service
Harbour Commissioners	Telecomm Eireann
Irish Rail	Community Welfare Officers
Irish Bus	Bord Gais Eireann (Irish Gas Board)
Electricity Supply Board	Red Cross Society
Irish Helicopters.	

2.6 COMMUNICATIONS

Communications is an essential part of the emergency planning and response system. In this section the communications framework under the following headings will be considered:

- 1 Communications between the emergency services
- 2 Information dissemination to the public and media
- 3 Telecommunications.

2.6.1 Communications between the emergency services

In preparation of all emergency plans the Local Competent Authorities consult as required with all other relevant organisations to ensure an integrated approach to a major emergency. The Co-ordinating Group for each functional area and the Cork Planning Group for the Cork/Kerry functional area are active in this co-ordinating role. Training programmes, emergency exercise simulations, and meetings provide excellent vehicles for communication and feed-back between the emergency services. In Ireland, the functional areas are small enough that the emergency services personnel become acquainted.

Each of the Local Competent Authorities specifies a **Controller of Operations** in there respective MEPs. The designated Controller of Operations for each emergency service provides overall control, direction and co-ordination of the activities of each respective emergency service at the scene of a major emergency. However, if a Danger Area has been established the senior fire brigade officer has overall control within this area.

In the event of a major emergency, the Co-ordinating Group may be convened at the discretion of any of the group following activation of the MEP. The Co-ordinating Group do not become involved in the detailed on site response. There function during a major emergency is as follows:

- monitoring the activities of all agencies responding to the emergency,

- maintaining liaison between the agencies,
- arranging for the mobilisation of additional resources as required,
- giving directions and policy decisions as required,
- facilitating the distribution of information to the media and the general public.

2.6.2 Telecommunications

The primary source of communications is via radio with backup from the Telecomm Eireann public telephone network and Eircell (Irish commercial cellular radio telephone system) phones. The designated emergency services have regional mobile radio systems. These are used to communicate data from the accident site. In addition, portable radio systems (walkie talkie) are used at the accident site. Depending upon the region, the emergency services have arrangements with Telecom Eireann for the provisions of extra lines and dedicated lines in the event of a major emergency. Several large industrial sites also have provisions for dedicated and additional lines. Eircell phones are used as a backup system. Lessons learnt from other countries indicate problems with communication via cellular systems as the lines become quickly overcrowded. As the technology in this area develops, there is scope for further investigation in this area.

At the emergency scene each emergency service should establish a control centre with portable radio communications facilities which are intrinsically safe and co-ordinated.

2.6.3 Information dissemination to the Public and Media

At a minimum the following information should generally be provided to the public:

- Nature of emergency and (likely) consequences,
- Advice on the actions and behaviour the public should or should not take,
- Details - updated as necessary - of measures being taken by the emergency services,
- Emergency telephone numbers which can be contacted for further information.

Account should be taken of the fact that in an emergency situation such numbers may be crowded by callers which, to some extent, may limit their usefulness.

The *Report on Peacetime Emergency Planning* identifies three stages of information provision to the public as follows:

- 1 Prior notification (where possible)
- 2 During an emergency the public and media should be informed of the status of the situation and action being taken by the emergency services
- 3 Post emergency liaison should be maintained with the public and media to provide suitable advice (where necessary) and information (e.g. traffic updates, casualty reports etc.).

Emergency planning must include appropriate systems for notifying the public and mechanisms for doing so. Systems for co-ordinating with the media to provide communication facilities e.g. radio and television, are pre-arranged and defined in the MEP.

To facilitate the dissemination of information to the media and general public the Garda Siochana establish an information centre at the site of a major emergency for use by the other relevant agencies. Each agency designates an information officer with specific roles and responsibilities. As detailed in Section 2.3.1. 2(d) - Information for the Safety of the Public, installations subject to the specific requirements of the "Seveso Regulations" must provide an information package to all those living and working in the vicinity of the site. Manufacturers liaise with the relevant emergency services and the HSA on a regular basis to review and update this information as necessary.

2.7 FUTURE DEVELOPMENTS

2.7.1 Combined Emergency Plan

Currently in each functional area, each emergency service has a Major Emergency Plan and an off-site emergency plan for each installation subject to the specific requirements of the "Seveso Regulations" (if there is an installation in that area). The plans are Co-ordinated by the Co-ordinating Group in each area. There have been initiatives to move away from the co-ordinated multiple plans to a single combined plan. As an example, this has been a recent initiative in the Cork region to form a single combined plan.

The Major Emergency Plan for the Cork region only, consists of the following:

- 1 Southern Health Board Major Accident Plan
- 1 Cork County Council Major Emergency Plan
- 1 Cork Corporation Major Emergency Plan
- 1 Garda Siochiana Major Emergency Plan.

In theory these plans are co-ordinated by the Co-ordinating Group and Cork Emergency Planning Group to avoid incompatibilities. However there are also gaps and incompatibilities as a result of the four separate plans which are co-ordinated to form the MEP for the Cork region. Therefore, there is currently an initiative being developed to revert to a single combined Major Emergency Plan for this area.

This combined plan, called the "Cork Region Emergency Plan", is based on the Southern Health Board plan with the other emergency services feeding into this plan. The combined plan is currently in its final draft stages and will be reviewed for final approval in the near future.

Overall, MEPs are becoming simpler and shorter and referencing the details in the form of PDAs.

2.7.2 Transport

The inter-departmental committee dealing with the transportation of Hazardous Substances by Rail is currently considering a proposal by Iarnod Eireann to transport approximately thirty dangerous chemical substances. They propose to transport these on goods trains with one wagon of dangerous goods per train. If such a proposal were accepted the scheme would have to be adapted to cater for the increased loads and resulting hazards.

3. ACCIDENTS

3.1 INTRODUCTION

In conjunction with the HSA, a number of fixed installation and transport accidents were selected for analysis. Fortunately, very few major accidents involving dangerous substances have occurred in Ireland, therefore the choice of accidents for analysis was limited in the first instance.

For the purposes of this study it was endeavoured to select serious accidents which illustrate lessons relevant to emergency planning and response. It should be noted that the accidents analysed are not the norm. In most cases the accidents are minor and have been responded to efficiently and quickly to avoid escalation of the situation.

Through meetings with the relevant manufacturers, Local Competent Authorities, HSA, central government bodies and other relevant organisations, the accident information was collated. Data on the following aspects of the accidents was compiled:

- Pre-planning
- Accident/Incident description
- Emergency Response
- Post accident actions
- Information dissemination to the public and media
- Lessons learnt following the accident.

Unfortunately, some information was difficult to obtain due to confidentiality restrictions, unavailability of official records of investigation and people originally involved in the accidents being no longer available for comment. However, much useful and accurate information was obtained specifically from the manufacturers involved and the relevant emergency services directly involved in the accidents. The manufacturers of installations subject to the "Seveso Regulations" were particularly co-operative. Press and media reports were used only as a backup to the definite factual information, as media reports may be inaccurate.

A quick reference list of the accidents chosen for study are detailed in section 3.2 below.

3.2. LIST OF ACCIDENTS

A. Fixed Installation

LOCATION	DATE	INCIDENT
Cork	1988	Gas Explosion
Shannon	1989	Pilot plant explosion
Cork	1990	Distillation Plant Explosion
Dublin	1991	Powder Explosion

B. Transport Accidents

LOCATION	DATE	INCIDENT
Cork	1979	Explosion and Fire on a ship and offshore jetty
Tuam	1985	Full tanker spillage of petrol
Robertstown	1985	Diesil oil spillage
Meath	1985	Hexane tanker collision with car
Kilkenny	1986	Hydrofluoric acid spill - drum fell off vehicle
Cork-Dublin Road	1987	Phthalic Anhydride spillage
Slane	1988	Sodium Hydroxide spillage
Donegal	1988	Petrol explosion and fire
Cork	1988	Formic acid leakage from drum following traffic accident
Tipperary	1989	Full tanker spillage of Creosote
Mayo	1991	Tank container of Acrylonitrile fell off vehicle
Leitrim	1991	Chromium Trioxide spillage.

3.3 SUMMARY OF ACCIDENTS FOR ANALYSIS

3.3.1 Fixed Installation

The criteria used to chose the accidents for analysis was fixed installations (storage and process) subject to the provisions of the "Seveso Regulations" where accidents occurred involving dangerous substances, as defined in the Regulations. In Ireland, relatively few "major accidents", as defined in the Regulations, have occurred. In total four fixed installation accident case histories have been chosen for analysis in this study. Of these, only one "major accident" has occurred at a fixed installation which was subject to the specific requirements defined in Regulations 12 - 18 of S.I. 292 of 1986 (on-site emergency plans, off-site emergency plans and information to the public). The other three accidents occurred at sites subject to the general responsibilities defined in Regulations 9 & 10 of S.I. No. 292 of 1986.

i Explosion at a fertiliser production plant, December 23, 1988, Cork Harbour

The accident occurred at 12:25 hours on 23 December 1988. This was a holiday, therefore many staff members were not on site at the time. The incident involved the rupture of a 24" pipe due to fatigue/corrosion induced by thermal cycling. This rupture resulted in the release and ignition of **hydrogen** in synthesis gas. The original rupture caused further damage to adjacent piping which resulted in a minor **ammonia** release. The smell of ammonia was tolerable and dissipated. The initial explosion was followed by two separate fires - a methane fire and a hydrogen fire.

The site emergency procedures were activated. The natural gas (**methane**) supply to the plant was cut off and the plant shut down.

There were no significant injuries and damage was largely confined to the plant. The noise caused by the explosion was reported up to a distance of a 10 mile radius from the plant. The main damage was in the immediate vicinity of the explosion and fire to pipework, vessels etc. Approximately 12 windows on site were broken and eight off-site claims ranging from damaged windows, roofs and slates in nearby houses were made. All damage to local residents property was fixed as soon as possible.

The plant was subject to the specific responsibilities defined in Regulations 12 - 18 of S.I. No. 292 of 1986 (i.e. on-site emergency plan, off-site emergency plan and information to the public).

The emergency pre-planning provisions in place were as follows:

- internal site emergency plan
- on-site emergency plan
- off-site emergency plan.

Local residents within a 1.5km radius of the site were provided with information packages as directed under the "Seveso Regulations". At the time of the accident the information was disseminated via the local newspaper every three months.

In response to the emergency the site foreman set off the fire alarm, mobilised the internal fire brigade (as specified in the internal site emergency plan) and shut down the plant. The foreman decided that no external emergency services were required to handle the emergency (as is his function under the internal site emergency plan). The on-site and off-site emergency plans were not specifically activated as it was deemed by the company that this was not necessary. A system of call out for specific company personnel was activated and they arrived at the site a half hour after the incident occurred.

Residents in the vicinity who heard the explosion telephoned the emergency services. The emergency services could not contact the site as all its phone lines were in use at the time. The emergency services activated the Major Emergency Plan based on the calls they received from residents and proceeded to the site. At the site the emergency services were not allowed entry by the site representative for safety reasons and because the internal staff had the situation under control. One fire brigade insisted on entry to the site and assembled themselves for emergency action. The manufacturer felt internal control of the emergency was best, as the fire brigade were not appropriately trained to deal specifically with the situation. The Garda Siochana controlled traffic for the site during the incident.

Approximately two - three hours after the accident a Company representative made statements to the media and public on the status of the accident. The main purpose of this was to allay public fears. Soon after the accident (when safe) a communication programme was arranged. As part of this, local residents visited the accident site and were given a presentation to ensure them that there would be no further problems.

The plant was closed for five weeks while investigations were conducted and the plant was re-established. Investigations by the HSA and external consultants were performed. Any

recommendations made were closely monitored by the HSA and the manufacturer during re-establishment. Before the plant recommenced production, a report of the accident, relevant investigation results and starting date were placed by the manufacturer in the local newspaper.

The incident constituted a "major accident" as defined in EC Directive 82/501/EEC, and was reported to the CEC under Article 11.1 of that Directive.

ii Explosion and fire in a chemical manufacturers, 28 June 1989, Shannon

At 16:30 hours on 28 June 1989 an explosion occurred in a plant manufacturing fine chemicals for the pharmaceutical industry. An operation to distil a crude **nitro-imidazole** compound at 100°C under a vacuum in laboratory trials had yielded a pure product. This operation was repeated at pilot scale and was performed in a 450 litre glass lined reactor. When the substance dissolved and the reactor agitator was activated a yellow fume emerged from the closed manlid. Due to a runaway reaction one explosion (blast approximately 2.5 kg TNT equivalent) occurred two seconds after the emergence of the fumes. The explosion was caused by the thermal decomposition of the material. The decomposition may have been promoted by **Manganese Dioxide** which accumulated as the product melted due to the design of the reactor used. **Carbon Dioxide** was also released in the explosion. A minor fire followed the explosion.

Two employees were trapped in the area of the explosion and fire. These employees were safely removed from the area, but were suffering from shock. Damage to the plant was extensive amounting to 0.65 MECU. Windows within a radius of 30m were broken.

The fire was already extinguished as a result of the internal site Fire Brigade action when the local fire brigade arrived on the scene. The Garda Siochana were also in attendance.

A cloud of CO₂ moved to the evacuation meeting area and as a result the evacuees had to be moved to an alternative location. The scenario of a gas cloud resulting from an emission at the plant moving to the meeting place and the resultant impacts had not been considered in the internal site emergency planning provisions. Therefore, no provisions were available for this situation at the time.

CO₂ and smoke due to the fire and explosion drifted slowly towards a near-by town, as a result of calm weather conditions. This caused public concern. Subsequent to the accident, a statement was given to the media, local residents and nearby industrial sites on the status of the accident. A representative from the plant appeared on national radio and TV to give the status of the accident.

The installation process was subject only to the general duties as defined in Regulations 9 and 10 of S.I. No. 292 of 1986.

Broad Emergency planning provisions were in place prior to the accident, however in hindsight, the manufacturer realised they were not sufficiently detailed and did not have all necessary areas catered for. For example there were no liaison procedures with the emergency services and no provision for dealing with the public and media in the event of an emergency. While hazard identification assessments were done it was considered that not all potential hazards and scenarios had been formally identified.

Subsequent to the accident the plant was shut for two weeks. Investigations were conducted

by the HSA and the manufacturer into the cause of the accident and recommendations were made. The implementation of the recommendations was monitored by the HSA. The local residents were kept informed and were invited to visit the site before it commenced operations again.

The company were successfully prosecuted under S.I. No. 292 of 1986.

iii Explosion at a Pharmaceutical manufacturers, 1 June 1990, Cork

A vessel rupture occurred at 17:03 hours on a Friday, in the tank farm area of the plant. The rupture was due to an exothermic reaction between **caustic** and **chloroform**, which accidentally contaminated the system, was not able to vent and hence exploded rupturing the still. No fire followed the explosion.

In response to the emergency, the Company emergency plan was activated. The specified alarms were activated and staff evacuated from the building. It was decided by the specified person in charge, that the Fire Brigade was not required and that it was appropriate for the staff on site to investigate the damage initially. This decision was based on the fact that the incident was the result of vessel rupture with no danger of fire. The Fire Brigade were notified of the accidents the following Monday. The Fire Brigade believed they should have been contacted immediately after the accident occurred. The Local Authority Environmental Engineer and the HSA were contacted immediately due to the possibility of potential environmental damage.

The neighbouring site was also informed of the accident and kept updated with any developments. The day following the accident (Saturday) the secretary of the residents committee was informed of the details of the accident and that no threat was posed to the public.

There were no casualties, but staff sprayed with material, as a result of the explosion, were examined by the site First Aid team. They were advised to see their local doctor. There was extensive damage to the tank farm area of the plant.

The installation process was subject only to the general duties as defined in Regulations 9 and 10 of S.I. No. 292 of 1986.

Prior to the accident, the company had internal emergency and evacuation provisions in place. These included the procedures to be followed by the site personnel in an emergency and provisions for contacting the Emergency Services. The site has its own internal fire service. Specific hazard identification assessments had not been formally conducted and there was no system of information dissemination to the public as this was not a legal requirement.

Subsequent to the accident production of one of the main products manufactured at the plant was suspended for six months because of the accident. Investigations of the accident were carried out by the HSA, the manufacturer and external consultants. Recommendations were made and have all been implemented. This implementation is monitored by the HSA.

iv Powder explosion at a chemical manufacturing plant, 17 March 1991, County Dublin

A powder explosion occurred at a chemical manufacturing plant at approximately 10:00 hours, on March 17, 1991, which was a public holiday in Ireland. However, the plant was manned on a twenty-four hour basis. The explosion was caused by the decomposition of

600kg of an organic **disulfide**. This material became damp and on heating underwent an exothermic reaction. The manufacturer was not aware of this reaction. The operation involving this material was a minor part of the production process at the site and only small amounts of the material were used. A fire ball went through the plant accompanying the explosion which resulted in superficial burns to plant materials in the immediate vicinity. The explosion and fireball lasted only a few minutes.

Two people were in the immediate vicinity of the explosion but were not injured. No injuries resulted from the accident but the roof was blown off the production area.

The installation process was subject to the general duties defined in Regulation 9 and 10 of S.I. 292 of 1986. A comprehensive internal site emergency plan was in place considering all aspects of emergency procedures for the entire plant and all employees. Material Safety Data Sheet (MSDS) for all materials in use and relevant site maps and plans were included. Procedures for providing information to the media and other relevant outside agencies were also included. The Emergency Plan was regularly updated and kept in the security hut at the entrance to the premises for access by the Emergency Services.

An internal fire crew and specified personnel were trained to deal with accidents at the site. Exercises were performed twice yearly. An internal hazard identification procedure and internal auditing system were in place at the site.

In response to the incident the internal site emergency plan was used as specified in the emergency plan. There was a site fire crew and the fire brigade were called to the emergency. The sprinkler system put out any potential fires.

The Emergency Plan was deemed to have worked well. The Material Safety Data Sheets for the material involved specify that care must be taken to avoid environmental contamination when disposing of this product. No environmental damage or health risks were caused as a result of the accident. All run-off water from the sprinklers was contained in the effluent treatment plant.

After the accident, an information programme was implemented to provide information to the HSA, Department of Health, Local Politicians and local residents, in that order of priority.

Local residents were invited to visit the plant and were given a description of the incident and reassured that it would not happen again.

Post accident investigations were carried out by the HSA, the manufacturer and external consultants. The plant was closed for two weeks before the main production process were recommenced. The HSA issued a prohibition notice on the process involved and set out conditions to ensure the integrity of plant aspects before commencement of operations was allowed.

3.3.2 TRANSPORT ACCIDENTS

The only major accident involving the transport of dangerous substances in Ireland has been the explosion and fire on a ship and offshore jetty at Whiddy Island, Cork in 1979. Even though this has occurred outside the time scale of ten years defined for the study, and predates Directive 82/501/EEC (Seveso) it has been agreed to include it, due to the representative nature of the accident. It is the largest accident involving dangerous substances in Ireland in which the emergency services were extensively involved and therefore may provide valuable information concerning the lessons learnt on emergency planning.

The majority of transport accidents/incidents involving dangerous substances are minor. According to the HSA, on average six noteworthy accidents occur per year. In determining the transport accidents for this study we have chosen those accidents involving dangerous substances requiring the appropriate emergency services to be notified. Transport accidents which were mainly traffic accidents have not been included except where a significant leakage of dangerous substances has occurred, damage has been directly related to the dangerous substances being transported or a relevant lesson on emergency planning may be learnt.

**i *Explosion and Fire on an oil tanker and jetty at Whiddy Island, Bantry, Cork
08 January 1979***

A large oil tanker containing Arabian **light crude**, was moored at an off-shore jetty approximately 1,300 feet off Whiddy Island. Early in the morning of 08 January 1979, a disastrous fire occurred which enveloped a large section of the ship and offshore jetty. A number of explosions accompanied the fire, one of which was massive and severely damaged the oil tanker and jetty area.

On alert of the disaster, emergency plans were put into operation. The **Major Accident Plan** was initiated by the Garda Siochana in the Bantry area. Local fire services from Bantry, Skibbereen and Dunmanway plus several helicopters, launches, tug and line boats were used during the emergency operation. Garda Siochana were stationed at Bantry pier to prevent interference with rescue services. A traffic system, morgue facilities and an incident and information centre were established. The Marine Rescue Co-ordination Centre at Shannon was contacted, but when the Garda Siochana were informed that the available helicopters could not operate at night the assistance of the Royal Navy helicopters was requested. An airfield near the town of Bantry lit by Electricity Supply Board vans and cars to enable the helicopters to land. Radio and telephone communications between the morgue, the Garda station and Whiddy Island were established. The Garda Siochana organised the search for the bodies of the victims.

There were fifty fatalities including all those aboard the tanker and the crew on the offshore jetty. The vessel was rendered a total wreck and extensive damage was caused to the off-shore jetty and its installations.

The Major Accident Plan for the Cork area was in place prior to the accident. This accident predates the requirements of the "Seveso Regulations". Inquiries into this accident were carried out by the Irish Department of Tourism and Transport and the Department of Labour. A public enquiry in the form of a Tribunal was also conducted and a report issued.

ii *Petrol leakage and fire in Tuam, 1985*

An articulated road tanker carrying **petrol** skidded on ice and jack-knifed. The tank overturned, petrol spilled from the compartment and caught fire immediately. The driver pulled out through the broken windscreen by a second driver who came on the scene. The second driver saved him by wrapping his overalls around him.

The tanker was completely destroyed. Windows and a door in a nearby house were damaged in the fire and a number of items were destroyed. The driver of the tanker received severe burns. The road was blocked for a considerable period of time.

iii Diesel oil spillage in Robertstown, 1985

An articulated tank vehicle was carrying 4,600 litres of **diesel oil**. While negotiating a humped back bridge over a canal, the lead in to the fifth wheel dropped too sharply and caught the outlet pipe from number one compartment fracturing it and dislocated the internal foot valve pushing it up into the tank. As a result, the full load of diesel oil leaked into the canal. The Emergency Services were called to clean up the incident.

The HSA cite this accident as an example of the importance of selecting routes which are suitable for transport.

iv Hexane, Gormanstown Co. Meath, 04 May 1985,

As the result of a collision with a car, at approximately 3:00 hours at Gormanstown, a tanker overturned carrying 5,000 gallons of **hexane**. The hexane, was imported from Holland through Greenore to its destination in Portlaoise. No leakage of hexane occurred.

Two people were killed and one critically injured as the result of the road accident - not the hexane.

As the tanker did not have the required hazardous substance markings, only an IMDG marking, the emergency services felt alot of time was wasted before the substance was identified. A number of houses and a petrol station nearby were evacuated as a precaution. The fire brigade sprayed the road and tanker with foam. The main Dublin-Belfast road was sealed off for half a mile for 12 hours so that the tanker container could be moved after being partly off loaded by a suitable portable pump into another road tanker brought to the scene.

v Hydrofluoric acid spill at Paulstown, Kilkenny, 24 November 1986

The containment structure holding the drums gave way and a 45 gallon drum of **hydrofluoric acid** fell from an articulated lorry carrying a full trailer load of these drums. The incident occurred at the junction of the N9 and N10 National Primary Routes. The barrel had upturned and was leaking slowly.

The Mhuine Bheag Fire Brigade, Carlow Fire Service were first in attendance at the scene who notified the Kilkenny Fire Service. In total a fire appliance from Mhuire Bheag Fire Brigade, an emergency tender from Carlow Fire Station, an emergency tender and a light 4 wheel drive pumper appliance from Kilkenny Fire Station attended the scene. The Garda Siochana were also in attendance.

The driver of the vehicle had noticed the barrel falling, knew the dangers of the substance and prevented anyone approaching the leaking barrels. The driver had the appropriate Tremcard and the vehicle had the correct hazardous substances warning placards.

The firemen isolated the area around the spill. Traffic on the N 9 was prevented from passing the spill; it was directed on to the N10 and then back to the N9 by a minor road. The Garda Siochana controlled the traffic.

The immediate problem was to prevent the spill spreading; this was accomplished by using turf mould (from a local supplier) to absorb the spilled acid. The firemen at the scene had to wear Breathing Apparatus (BA) and Gas Tight Chemical Protection Suits.

It was considered advisable to evacuate the nearby houses but residents would not leave, even though approached by both the Fire Service and the Garda Siochana. They were therefore advised to remain indoors and keep windows and doors closed.

The driver notified the company whose chemicals were being shipped. As the company was part of a scheme which provides mutual assistance and advice during such incidents, a chemist was sent to the scene.

In consultation with the chemist it was decided to move the drum to an isolated quarry, allow the acid to leak out onto a bed of lime which would neutralise the acid and then bury the lime, neutralised acid, barrel etc. The barrel was therefore put into a plastic tank, lifted onto a truck using machinery, driven to the quarry, off-loaded using machinery and allowed to leak onto a bed of lime. The lime, plastic tank, truck and machinery were provided by Kilkenny County Council. Again the main problem was that all personnel at the spill area and handling the barrel had to wear BA sets and Gas Tight Chemical Protection Suits. During transportation to the quarry a Garda vehicle preceded the truck to warn people to stay indoors. The truck was accompanied by the Emergency Tender and a Water Carrier from Kilkenny Fire Services which had been brought to the scene of the incident.

Back at Paulstown the turf mould which had been used to absorb the spilled acid was gathered up in plastic bags and brought to the quarry where it was mixed with lime to neutralise the acid. Lime was spread on the road at the scene of the spill and then the road was washed with copious amounts of water.

When the barrel had emptied itself onto the lime it was flushed with water and then lime, turf mould and barrel were buried using a County Council machine. The incident was finally closed at approximately 19.45 hours.

At the quarry, local residents who had gathered to see what was happening were briefed by the Fire Service personnel and the chemist as to what was happening and were reassured that, once neutralised by the lime, the acid would be harmless.

vi Phthalic Anhydride main Cork - Dublin Road near Glanmire village, 6 February 1987

Several packages of **phthalic anhydride**, packed in 25kg bags, fell off a flatbed trailer while it was travelling around a narrow bend on the Dublin - Cork road near Glanmire. Several bags of the powder substance burst.

The driver of the trailer had the appropriate documentation on the nature of the load and the precautions to be taken in the event of a spillage.

The police and fire services coordinated the emergency response. The event is alleged to have occurred at 15:00 hours. Cork City Fire Services were the first on the scene. They then contacted the Midleton Fire Services to accompany them. No action was taken until the appropriate procedures were determined using the chemdata system at the Fire Brigade Control Centre. A chemist from the manufacturer was also on the scene to provide expertise. The Fire services, in appropriate protective clothing (chemical suits and BA), spent five hours clearing the spillage. Fire officers said that a load of this nature should have been transported in a closed truck so as to contain the substance if leakage occurred - not an open trailer.

Once the trailer was reloaded and on route to its destination once again, some more bags of the substance fell off. Two bags, one burst, were found at Penrose Quay (along the trailers route) subsequent to the initial spillage by the police. They were transported to the destination plant of the trailer by the police using the appropriate protective measures. The police retraced the trucks route through Cork City to determine if any more of the substance had spilled.

There was no long term resulting damage.

The carrier was prosecuted by the HSA and fined for failure to secure the load.

vii *Sodium Hydroxide, Slane, 28 April 1988*

A load of **pearl caustic soda**(sodium hydroxide **gold**) in 25 kg palletised and shrink wrapped bags (600 + bags) was transported from the UK via Northern Ireland to Cork on a flatbed trailer. Eight bags of the pearl caustic fell off the flat bed and burst on the road. The driver did not stop. Eight bags were lost, however, only six were recovered.

Children from a nearby school handled the pearl caustic. As a result, three children received severe burns.

The Fire Brigade and Garda Siochana were in attendance at the scene of the incident. They cordoned off the area, recovered and re-bagged the caustic soda. The Fire Brigade used BA and protective clothing.

The bags were appropriately labelled which identified the substance and the manufacturer. The Hazchem system was used to determine the appropriate actions to be taken.

At the time of the incident the local radio station was used to inform the local population that the caustic soda had fallen from a passing vehicle and that it would cause severe damage to the eyes and skin.

The accident was subsequently reported to the Department of Labour.

The carrier was traced and subsequently prosecuted by the HSA and fined.

viii *Petrol explosion and fire, Donegal, 29/03/88*

A portable pump was being used to pump **petrol** from an underground storage tank to a tanker. This activity was taking place inside a shed. The operating switch of the pump was placed on top of the tanker. While splash filling (which is prohibited) was in progress an explosion and fire occurred.

On investigation, it was determined that the operating switch was not suitable for use in an explosive atmosphere.

Two men were injured and the shed was burned down.

A prosecution was made for not having a licence to store petrol and for not adhering to the proper safety precautions for petrol.

ix *Spillage of Silage Additive containing formic acid, Dennehy's Cross, Cork, 19/05/88*

A silage additive containing **formic acid** was being transported in drums. A strap holding the drums on the carrier vehicle came loose and a drum fell off onto the roadway at Dennehy's Cross in Cork. The drum fractured and 100 kg of the substance spilled onto the roadway.

The emergency response was coordinated by the fire brigade, police and ambulance personnel. The area was sealed to traffic once the incident was notified to the emergency services and the roadway cleared by the fire brigade using suitable protective clothing and equipment.

The transport company was prosecuted by the HSA and fined.

x *Leakage of creosote, outside Tipperary, 21/10/88*

A JCB digger and a tank vehicle containing 4,500 gallons of **creosote** collided resulting in the

tanker overturning on the side of the road. As a result of the collision, one of the lids on the tanker was damaged and bent with the result that the entire contents of creosote leaked onto the road and adjoining fields. There were no warning hazard plates on the vehicle and the driver did not have any documentation of the procedures to follow in the event of an accident.

On investigation it was determined that the rear bumper on the tanker did not have an adequate gap between it and the back of the tanker and the protecting pipes. Such a gap would be necessary to prevent the contents of the tank from spilling if involved in an accident.

The Fire Services were at the scene for 7.5 hours. The tanker had to be lifted by crane back onto its wheels.

The carrier was prosecuted for not having certification under the Dangerous Substances Regulations, for the vehicle failing to carry required display plates, failing to arrange for the safe disposal of creosote, failure to notify the Department of Labour (HSA) of the accident and for carrying creosote in a vehicle which did not comply with the requirements relating to the construction and operation of the vehicle.

xi Tank container of acrylonitrile fell off a vehicle, December 1991, Mayo

A tank containing 18,200 litres of, the highly flammable and toxic substance, acrylonitrile fell from a transport vehicle outside its destination. The tank had been transported by rail from Dublin to Ballina train station. It was being transported by road to its destination in Killala. The tank fell off the vehicle and overturned on its side. The tank frame was badly damaged by the fall, but the tank sustained only minor damage. None of the substance leaked. The accident is of interest as it should be highly unlikely for such a toxic substance to fall off its transport vehicle. The twist locks on the truck were found to be deficient - in that when lowered or dropped they appeared locked even though they were not.

The destination company response unit was on the scene within three minutes even though there was no spillage.

The transport company were prosecuted for not stowing and securing the tank properly and fined £1,000.

xii Chromium trioxide leakage, Letrim, 1991

A van carrying chromium trioxide and sulphuric acid skidded. A spillage of the 50kg chromium trioxide container occurred when the drum was flung from the van as a result of the impact with the roadside. The Local Authority environmental engineers removed an area of contaminated farm land where the leakage occurred and performed a full clean up.

3.4 DATA COLLECTION FORM

The format for the Data Collection Form has been developed and commented on by representatives from the Department of the Environment, HSA and Department of Health. A blank Data Collection Form is included at Appendix 9. A Data Collection Form has been completed for each accident and submitted to the EC. For confidentiality reasons, these forms have not been included in the published report. Only the summaries of the accidents are included in this report.

4. LESSONS LEARNT

4.1 INTRODUCTION

None of the on-site/off-site emergency plans for installations subject to the "Seveso Regulations" in Ireland have ever been fully activated, therefore this cannot be analysed. However, on analysis of the accidents detailed in Section III, we have endeavoured to extract the relevant lessons learnt by the manufacturers, emergency services and those bodies responsible for policy and legislation effecting emergency planning and response. Each accident has been evaluated in this manner and the lessons learnt have been summarised under specific topics:

- Emergency Policy
- Emergency Pre-planning
- Accident Response
- Information dissemination to the public & media
- Post accident actions.

In addition, lessons learnt as a result of training and exercise programmes and specific recommendations made by the sources who provided information for this study have also been included in this section. Many of these recommendations are already part of the emergency planning situation in Ireland. They are highlighted for their importance and interest to emergency planners in other EC countries. For your information, it has been indicated where new schemes were introduced as a result of lessons learnt. We believe this is of relevance to the study. Finally, a section on new initiatives has been included to illustrate possible future developments in emergency planning and response in Ireland.

4.2 EMERGENCY PLANNING POLICY AND ORGANISATIONAL STRUCTURE

Several opinions and recommendations have been expressed during the course of research for this report on the overall emergency planning policy . These have been summarised in the following sections:

4.2.1 Organisation

In terms of the installations subject to the Seveso Regulations, the Central and Local Competent Authorities are respectively responsible for the enforcement and implementation of the "Seveso Regulations" requirements.

For MEPs, the responsibility is spread between several government departments and designated emergency services which have limited resources and other non emergency planning functions to perform. The main responsibility to implement and co-ordinate the MEP is at local level with guidance provided by the relevant central government departments. The Inter-Departmental Committee on Peacetime Emergency Planning meets annually and plays an advisory role.

In addition to this organisational structure, some sources believe there is a requirement for a formal, single, independent organisation dedicated solely to emergency planning. The organisation would regulate and monitor the implementation of the MEP to ensure effective co-ordination and practical implementation on a national scale i.e. to ensure the

conceptualised theoretical emergency planning strategy developed "on paper" via the MEP is implemented in practice. In addition, this organisation could act as the main feedback mechanism to ensure all relevant information from accident investigation, exercises, seminars etc. is disseminated and understood by all relevant bodies.

This organisation would be composed of representatives from the organisations currently involved in emergency planning such as the Departments of the Environment, Health, Enterprise and Employment, Department of Transport, Energy and Communications, the HSA, emergency services, industry etc., with the main focus being at local level. Such an organisation could liaise with or include members of the Co-ordinating Groups in order to monitor the Framework implementation at a local level.

These formalised organisational structures focus the emergency planning responsibility and allocate specific manpower resources to these tasks. Such formalised mechanisms provide a continuous means of ensuring the Framework is as effective in practice as it is theoretically conceived.

It should be noted that not all sources agree on this issue. Some sources believe the current organisational structure meets these requirements. As there is a difference of opinion on this issue further investigation is recommended.

4.2.3 Legislation

The fact that the Major Emergency Planning Framework is not implemented by legislation, except those installations subject to the "Seveso Regulations", is seen as having both positive and negative aspects. The lack of legislation is perceived to afford flexibility to the system which is a necessity. However, in order to suitably formalise the Framework some sources recommend the introduction of suitable minimal statutory instruments designed not to inhibit the flexibility of the current system.

Several contact sources considered that some sites currently not subject to the "Seveso Regulations", but in their opinion just as dangerous, should be controlled similarly. Because of the limits on the quantities of dangerous substances specified in the Regulations, sites using quantities of dangerous substances below these limits are not subject to the provisions of the legislation. Therefore the legislative control over these installations is comparatively less stringent, particularly with respect to off-site emergency planning. In this respect, it is recommended that the legislative structure governing installations using quantities of dangerous substances below the limits specified in the Regulations, but which pose a significant hazard, should be reviewed.

4.3 EMERGENCY PRE-PLANNING

4.3.1 Plan Content

The content and quality of emergency plans will determine to a large extent the efficiency and suitability of the response to an emergency. All relevant provisions must be considered comprehensively when designing the plan. Extensive consultation must occur between all relevant organisations to ensure integration and coordination of the emergency response. The

plan must be reviewed and tested via seminars, meetings and exercises respectively on a regular basis.

The following specific aspects have been stressed by sources as essential components of the emergency planning system:

4.3.1.1 Hazard Analysis

The first step in hazard analysis is to identify all the significant major hazards in each functional area and the associated risks. Subsequently, a detailed analysis of the risks may be conducted. In performing the analysis the potential for specific accidents occurring must be evaluated in conjunction with the ability of the emergency services and the community to respond. Resources must be allocated based on the perceived potential and likely hazards identified. Scenarios may be developed to consider all the potential permutations for likely accidents and the corresponding required emergency response.

4.3.1.2 Resource Analysis

Emergency Planning should be considered in the context of the relationship between the perceived realistic hazards and the resources available to meet them. Based on the required emergency responses necessary to handle the risks identified in the hazard analysis, resources must be allocated accordingly. Resources may include people with specific skills, finance, specialist equipment, materials, suppliers, facilities etc..in the functional area or at the nearest possible location. A resource analysis will determine these resources and how they should be allocated. It is impractical that every emergency service would be fully equipped to handle every conceivable type of incident. Therefore, consultation should occur between the emergency services, industry, suppliers etc.. to determine the location, amount and accessibility of the required resources. For these purposes it is desirable that, in general, equipment of various services be standardised as far as possible. Emergency Services have experienced difficulty in obtaining supplies outside of normal office hours, which highlights further how resource provisions must be determined in advance.

4.3.1.2.1 Training

Continuous Training, as necessary, in the use of specialist equipment, materials and procedures for dealing with incidents involving dangerous substances is an integral component of emergency planning. In particular training should be provided in specialised skills such as performing hazard assessments, or in specific roles i.e. Controller of Operations, member of a Co-ordinating group etc...to ensure effective performance. Specifically, installations subject to the "Seveso Regulations" and the emergency services recommend co-ordinating training so that the emergency services are familiar with the procedures for dealing with emergencies at these specific locations.

4.3.1.2.2 Funding

In order to effectively implement an emergency planning strategy appropriate funding must be provided. It has been suggested that emergency planning funding for personnel, training, exercises, provisions e.g. equipment etc.. should be allocated in national and local budgets. A further suggestion is to consider the allocation of EC funding for emergency exercises as these pose a substantial expenditure.

4.3.1.3 Pre-Determined Arrangements (PDAs)

Established PDAs for dealing with anticipated emergency scenarios save time during an activated emergency response. Inter-agency arrangements should be determined in advance and practised.

PDAs should be established for all relevant population risk groups. Risk groups within the population and provisions for notifying and communicating with them in the event of an emergency should be identified in advance. Risk groups may include, for example, the handicapped, deaf and immobile sectors of the population who are not able to respond to conventional emergency warning systems.

4.3.1.4 Exceptional Measures

The procedures and authorisations necessary to enable the emergency services to take exceptional measures in an emergency situation should be clarified in the emergency plans. In particular, authorisation to incur exceptional expenditure or to requisition special equipment should be specified.

4.3.1.5 Environmental Pollution

Environmental degradation may result from spillages of dangerous substances entering the environment through various pathways; air, surface water, groundwater, soil etc... This pollution may occur as the direct result of an accident (e.g. the spillages of chromium trioxide, petrol and creosote) or due to the clean up procedures e.g. run-off from contaminated water. While operationally, the emergency services and industry may be aware of this and are active in preventing environmental degradation as a result of an accident, formal provisions to prevent and minimise environmental pollution should be specified in emergency plans. Hazard analysis should include environmental impacts and corresponding scenarios for accidents and responses should be developed. Modelling tools which illustrate the potential pathways of pollutants into the environment, determine their resulting impacts and how to ameliorate their effects e.g. air dispersion modelling for toxic clouds, are recommended for this type of scenario development. This approach is currently used by industry and the competent authorities. In particular, information on modelling would be expected in the notifications required under the "Seveso Regulations".

It is expected that specific guidance on the environmental aspects of emergency planning will be provided by the newly established Environmental Protection Agency in Ireland.

4.3.1.6 Meteorological data

Provisions for obtaining meteorological data on a continuous basis should be included in emergency plans. This information is crucial to determining the behaviour of toxic clouds etc. The notified sites under the "Seveso Regulations" have a continuous interface with the local Meteorological Services. However, the availability of current accurate data may be limited by the proximity of the installation to the Meteorological Service. A system of establishing automated meteorological stations at specific installations is recommended. The Meteorological service have an arrangement to provide consultation and early warning in the event of dangerous emissions originating in other countries which may affect Ireland.

4.3.1.7 Co-ordination

It has been stressed that co-ordination between the relevant emergency services, industry (in

particular sites subject to the "Seveso Regulations"), the HSA and other relevant agencies is essential in performing pre-emergency planning activities e.g. establishing PDAs etc... Hazard and resource analysis performed by manufacturers are communicated to the relevant agencies for analysis in terms of their requirements and resources respectively, to ensure co-ordination between the two. Inter-agency co-ordination is valuable in establishing a rapport between agencies and individuals likely to be involved in an emergency response. It can ensure speedy co-ordination in an emergency situation.

Emergency planning provisions should concentrate on specifying organisational and inter-organisational relationships as well as operational functions. The operational services are those normally practised by the emergency services, whereas the inter-organisational co-ordination required for a major emergency is not normally practised and therefore warrants specific provisions.

4.3.2 Industrial Fixed Installation Emergency Planning Provisions

Industrial installations can be proactive in accident prevention measures by being aware of the hazards and associated risks and implementing systems to safeguard man and the environment from them. Firstly they need information on mechanisms to prevent accidents involving dangerous substances. They must be fully aware of emergency planning requirements such as those under the "Seveso Regulations". Meetings and seminars for industry, Local Competent Authorities, the Central Competent Authority and all other organisations relevant to emergency planning provide a continuous media for communications and discussion on accident prevention and other relevant emergency planning issues.

Recommendations for accident prevention systems include hazard identification and analysis and the implementation of internal safety and environmental management systems e.g. those schemes implemented under the Responsible Care initiative.

As part of this proactive approach, specific emergency planning provisions are developed as described in Section II. Liaison with the HSA, Local Competent Authorities etc... to develop emergency planning provisions is essential. Training programmes and exercises for site personnel as well as the Emergency Services (in particular the Local Authority) are conducted by several sites.

As indicated in the accidents analysed, unexpected chemical reactions can occur when normal circumstances are altered e.g. when a contaminant enters the system, or when a laboratory trial is conducted at pilot level. In addition, lack of formalised procedures to identify all reactions and information about a product under all possible conditions can have explosive consequences, as illustrated in the fixed installation accidents in Dublin and Shannon. These types of accidents may be prevented by performing stringent, comprehensive hazard analysis procedures and implementing the associated protective measures. However, the comprehensiveness of these procedures is generally dictated by financial, manpower and time constraints. Recommendations to prevent, as far as possible such accidents occurring include the implementation of formal, stringent procedures for new product introduction and for change control. In addition, internal audits are recommended to evaluate the technical, safety, environmental and emergency planning systems at installations. This is an area which we recommend requires further investigation.

Finally, it is felt that no matter how efficient the proactive measures to prevent accidents and the emergency response procedures, all those involved in an emergency must use common sense and "think on their feet" in an emergency situation.

4.3.3 Transport Emergency Planning Procedures

In addition to the provisions for the transport of dangerous substances detailed in Section 2.4.4, the following recommendations are highlighted for the transport of dangerous substances.

4.3.3.1 Integrity of containment structures

Prior to transport, the suitability of the containment vessels, packaging and transport vehicle to the dangerous substances being conveyed must be determined to ensure the integrity of the substance during transport. Inadequate containment and vehicle design were causal factors in two of the accidents analysed in Section III. The phthalic anhydride should have been transported in a closed truck to contain the powdered substance if the packaging became damaged. Deficiencies in the containment structure on the vehicles for both the formic acid spillage and acrylonitrile incident resulted in the drums and tank container respectively, falling off the vehicle.

4.3.3.2 Routing

When determining the routes used for the transport of dangerous substances by road the following issues should be considered where possible:

- (a) The suitability of the route compared to the size and weight of the vehicle. The diesel spillage at Robertstown was the result of the tank trying to negotiate a humped back bridge, which was not a suitable route for this vehicle in the first place.
- (b) Densely populated areas should be avoided.
- (c) Areas with heavy traffic congestion at specific times should be avoided.

The transport of dangerous substances by rail as described in Section 2.4.4.2, is well managed. The relevant emergency services are notified of the movements of dangerous substances by rail through their functional areas. The train is rescheduled in the event of large public gatherings in the vicinity of a rail route. The Garda Siochana strongly recommend the prior determination of the logistical arrangements for accessing every mile of rail track in the event of an emergency as described in Section 2.4.4.2.

4.3.3.3 Transport by sea

Under the IMDG Code, a Dangerous Goods Note is required for transport by sea. However, some carriers recommend the use of TREMCARDS on transports by sea in addition to the Dangerous Goods Note. For hazardous cargo, notices giving the UN number and the location of the substances on the ship should be placed on notice boards for the attention of the ships officer in the event of an emergency. The carrier should provide the local emergency services with a listing of the hazardous substances being carried on ships listing their UN numbers.

4.3.3.4 Transporters and drivers

Carriers recommend that the transport vehicles used are radio controlled, however, as interference in communications can result in inaccurate information being transmitted,

dedicated lines where possible are suggested. In addition, the drivers are trained in conjunction with the requirements of the European Communities (Vocational Training of Drivers of Vehicles Carrying Dangerous Goods) Regulations. Prior to carriage of dangerous goods, transporters should determine the safety standards adhered to by the prospective client. If required, the transporter recommends the discussion of all safety procedures with the client to prevent misunderstanding and ensure the client complies with the necessary requirements.

4.3.3.5 Storage Areas

As leakages etc... may occur in storage areas prior to transport, transporters recommend that a control system be operated in this area. For example, one recommendation is that all gantry movements in storage areas are computer operated and videoed. When vehicles come into the storage area, the UN and EEC numbers of the substances carried are logged at the gatehouse on the computer and allocated a number. Once entered into the system these numbers give total information on the substances carried. Therefore, if an accident occurs in the storage area the computer can immediately determine what it contains and the implications. Other chemicals which could be hazardous in the event of an accident/leak of this substance can be located and removed quickly using this system.

4.3.4 Evaluation of the emergency planning system

Several mechanisms exist for evaluating emergency plans. The plans must be reviewed and updated on a regular basis. Exercises to practically test the plan should be organised and seminars/meetings should be conducted. Representatives from all relevant organisations e.g. emergency services, industry, government, HSA etc.. must be involved in these mechanisms to ensure effective evaluation. In the light of information from accidents/incidents at home and abroad, exercise debriefs, emergency planning policy initiatives etc... the emergency plans should be evaluated and modified accordingly in an iterative process to ensure continuous improvement in the system.

4.3.4.1 Exercises

Exercises of some form (table top/full scale) should be conducted on a regular basis to test the effectiveness of the emergency plans and identify practical deficiencies in procedures or resources prior to an emergency. All relevant organisations should be represented at exercises either to participate or as observers to monitor the exercise. Full scale exercises will include representatives from all organisations. Generally a realistic scenario involving the co-ordination of all the emergency services is conducted. Adequate advance preparation is recommended to determine the required objectives of the exercise and to develop a purposeful scenario and narrative. Video of the exercises has proved to be a useful learning tool.

Exercises provide an opportunity for personnel to familiarise themselves practically with their roles and responsibilities and those of the other organisations involved. Formal procedures for debrief subsequent to the exercise should ensure a comprehensive review of the lessons learnt from the exercise and the circulation of this information to all relevant agencies via a report.

4.4 ACCIDENT RESPONSE

4.4.1 Activation of Plan

It has been learnt that the criteria for activation of the MEP must be clear or else confusion will arise as to whether a situation warrants its activation. The guidelines are that the MEP should be activated for "*any event or threatened event*" beyond the normal capability of the emergency services. It is not necessary to implement every detail of the plan. PDAs for dealing with the necessary aspects of the emergency will be implemented as required. The MEP must be flexible enough to be scaled down as required.

4.4.2 Information at the scene of an accident

As illustrated in the transport accidents involving hexane and creosote, precious response time is wasted at the scene of an emergency due to a lack of appropriate information or incorrect information concerning the dangerous substances involved. Therefore, it is essential to set up systems to quickly identify dangerous substances and determine the most effective action to be taken. In the transportation of dangerous substances the labelling and identification systems described in section 2.4.4, such as ADR/RID and Hazchem, are found to be effective if implemented appropriately. At some incidents, emergency services have found Tremcards from previous deliveries in the vehicle and the driver unable to indicate which Tremcard is current.

Once identified the emergency services may determine the appropriate action to protect themselves and respond to the situation effectively by access to systems such as Chemdata. Provisions for contacting personnel with expertise of dangerous substances are essential. The caustic soda incident in Slane and the hydrofluoric acid spillage in Kilkenny illustrate how the correct information held on the transport vehicle and advice from expert sources respectively, greatly helps the response to a transport accident involving dangerous substances.

It is recommended that databases of hazardous chemical substances include not only information on the dangerous substances but also the products of combustion and known reactions, as well as chemicals which should not be allowed to come into contact with it.

At sites which are not staffed on a 24 hour basis it may not be possible to obtain accurate information on dangerous substances at the site. Therefore, at installations storing and/holding dangerous substances all storage containers of dangerous substances should be clearly labelled. Maps, sketches, aerial surveys of installations should also be available as part of emergency plans to focus discussions and plan actions in the event of an emergency.

Information on the movement of dangerous substances by all modes of transport through each functional area should be held and accessible as required by the emergency services etc... Currently this information is only available for dangerous substances transported by rail and sea. However, information is currently being obtained for installations subject to the "Seveso Regulations" in the Cork/Kerry functional area on all inputs and outputs of dangerous substances relevant to these sites via all modes of transport.

4.4.3 Co-ordination, Communication and Control

As none of the on-site/off-site emergency plans for installations subject to the "Seveso Regulations" in Ireland have ever been fully activated, the resulting co-ordination, communication and control cannot be analysed. However, the Major Accident Plan has been activated in an accident involving dangerous substances i.e. the Whiddy Island disaster. As detailed in section 3.3.2, this 1979 accident predates the Seveso Regulations. The investigating tribunal concluded that the Major Accident Plan and the response by the emergency services involved was efficient, prompt and worked well. It was concluded that, irrespective of this, there was nothing that could have been done to save those who died in the accident.

The Kilkenny transport incident involving hydrofluoric acid also illustrates effective co-ordination between the Garda Siochana, Fire Services and specialist chemical advisers.

Effective control and communications is essential to an effective emergency response. In order to ensure this, it is recommended that a system to control the emergency situation, the responding personnel and equipment must be established immediately at the scene of an incident. This will provide a focus for communications and co- operation. Experience from emergencies and exercises indicates that adequate communications can be a problem and without effective communications good co- ordination cannot be achieved. In order to establish control and communication it is recommended that the Control and Holding Areas and location of the Co-ordinating Group are established as soon as possible in the event of a major emergency. This will facilitate the following:

1. Communications and co-ordination between the various Controllers of Operations and senior personnel. Each must communicate with their counterparts in the other responding agencies to avoid duplication and ensure maximum efficiency of response.
2. Collection of information on the emergency. Specifically it has been found that a communication breakdown occurs between those at the scene of the incident and Controllers of Operation and the Co-ordinating Group. Provisions are recommended to designate specific personnel to collect information and report back to the Controllers and the Co-ordinating Group.
3. Identification of where to seek assistance and guidance for both the response personnel and public.
4. The prioritisation of actions.
5. Facilitate the deployment of resources at the site.

The issue of who/whom has overall control in a major emergency can be sensitive and has many implications. As described in Section 2.6.1, the overall control via the Co-ordinating Group is a function of multiple co-ordination between the designated emergency services, except for when a Danger Area is established, in which the senior fire brigade has overall control. Due to the nature of chemical emergencies and the rapidity at which decisions are required several sources recommend that one designated key individual should have overall control of the emergency response. However, other sources feel that the multiple control is beneficial in that there is a backup decision making process. As there appears to be a difference of opinion on this issue, further investigation is recommended in this area.

At fixed installations, specific agreements should be determined to clarify who has overall

control - the emergency services or the manufacturer. As a result of the conflict between the internal and external emergency services at the accident in the fertiliser plant in Cork, it was agreed that the manufacturer has overall control in terms of the actions taken for emergencies at the manufacturer's installation. Improved communications and co-ordination via consultation and training schemes between the emergency services and the manufacturer has ameliorated such conflicts.

For additional services called in to assist the emergency services (e.g. Civil Defence, Army) overall control is exercised by the Controller of Operations responsible for their call out. Finally, in order to practically facilitate co-ordination and communications it is recommended that personnel responding to the emergencies are easily identified. Emergency services personnel, experts etc... arriving at the scene of an accident in civilian clothing without suitable identification detailing their expertise, results in confusion and delays. Therefore all non-uniformed responding personnel are issued with PVC jerkins colour coded in relation to their job/function with a 2" reflective tape at the bottom of the jerkin.

4.4.4 Evacuation

The unusual scenario of a gas cloud moving towards the evacuation meeting point is illustrated by the accident at the chemical manufacturers in Shannon. This highlights the necessity for alternative evacuation and assembly provisions and/or gas protective measures to be set up in the event of contamination of the site, danger from emitted gases etc.

4.5 INFORMATION DISSEMINATION TO THE PUBLIC AND MEDIA

The provision of suitable information to the public concerning installations subject to the specific requirements of the Seveso Regulations" is a proactive emergency planning measure. The specific content of this information is detailed in section 2.4.1.2. Some of the specific recommended methods used by industry to meet these requirements are detailed below.

Several installations operate communications programmes consisting of information packages sent out to target audiences and inviting them to visit the site. Initially, some manufacturers were cautious about disseminating safety information to the public. However, they have learnt that the more information they provide, the better the response from the residents. It is believed that using the local newspaper as a medium to disseminate this information does not target the total audience. Therefore leaflets are sent to all residences and installations in the vicinity of an installation detailing the action to be taken in the event of an emergency.

These actions include the following information:

- protective measures such as closing windows and doors,
- the local radio station to tune to for information,
- residents are asked to avoid using the telephone to avoid overloading the system,
- instruction to wait indoors until the Garda Siochana give the all clear.

In particular, some installations have installed alarm systems to alert residents to possible

leakages of dangerous substances. Information on the procedures to take on hearing these alarms and dates and times of alarm tests is contained in the leaflets sent to residents.

Information sheets on the dangerous substances used are distributed by many installations. Information leaflets are also provided to visitors and contractors at an installation containing data on fire, safety, evacuation and security procedures.

Several installations operate a programme whereby the public may visit the site at a specified time and speak to personnel on safety issues. Specific audiences such as local residents, schools, local politicians, teachers, clergy, environmental groups etc... are targeted by installations in their information programmes.

For installations which are located in an industrial area it is recommended that plans are established, where relevant, for a combined help system with neighboring installations in the event of any emergency.

In the Major Emergency Planning it is strongly recommended that provisions are included to establish communications to the public and media in the event of an emergency. As described in section 2.6.3, these arrangements are for establishing communications media as well as disseminating information. Manufactures also make provisions in their plans for handling enquiries etc. from the press and media. Manufacturers recommend that a company representative is allocated to keep the press and public informed on the status of the incident, any threats to health, the environment etc... during and subsequent to the accident.

Following accidents and before recommencement of operations, many manufacturers have communicated to the public via newspaper etc... the results of the investigation of the accident, recommendations made and their implementation, plus measures to ensure such accidents do not happen again. Also local residents and other interested bodies are invited to visit the site, as described above, to allay their fears.

As there is a conflict of interest between the aims of the media and the responding emergency services in the event of an emergency, it is recommended that an understanding is agreed with media sources as part of the emergency pre-planning activities. Suitable arrangements in this area are currently being developed in Ireland.

4.6 POST ACCIDENT

4.6.1 Investigation and feedback

Following an emergency involving dangerous substances mechanisms for investigation, reporting, feedback and follow up must be instigated to ensure that lessons learnt are documented and circulated to all relevant personnel. This information may then be used to ensure similar events do not occur in future.

Following the investigation/reporting of accidents, a formal mechanism should be established to feedback relevant information to all relevant organisations in industry, emergency services, government, enforcement etc. within the constraints of the manufacturers confidentiality requirements. All organisations involved in emergency planning should receive this

information so that it may be used for future emergency planning. As described in Section 2.5.4, FICI is currently developing a system of disseminating information on accidents at Federation member sites to Federation members for these purposes.

Companies with several sites within the same country or abroad operate formal hazard communications programmes whereby lessons learnt following accidents, exercises etc.. are communicated to each site with a view to improving safety, systems and emergency planning.

Forums such as seminars, meetings etc.. involving representatives from industry, Local Competent Authorities, Company Authorities etc provide an ideal opportunity for discussion of feedback from accidents and how the information may be used to improve the emergency planning and accident response system.

As no "major accidents" have occurred in Ireland which warrant activation of the "Seveso Regulations" on-site and off-site emergency plans, it is important to analyse all relevant accidents which occur and develop the potential likely scenario further to identify all short and long-term implications so that provisions may be established. The Health Board particularly stresses the need to consider all relevant medical and psychological impacts of "major accidents" and whether facilities are available to meet the potential requirements.

4.6.2 Confidentiality

In all communications and feedback mechanisms, confidentiality of information must be handled appropriately. A balance must be achieved between the commercial confidentiality requirements of the manufacturer and the need to make all relevant information available to the bodies involved in Emergency Planning. Some sources feel that the freedom of access to information is limited in this area and this hinders essential communications mechanisms. These sources believe that confidentiality restrictions are such that relevant and necessary information flow between industry, the Central Competent Authority and the Local Competent Authorities is obstructed for the purposes of emergency planning review. The result is that sufficient feedback from accidents relevant to organisations for emergency planning purposes is not always obtainable. The Competent Authority do not agree with this opinion. Therefore, there is a requirement for developing provisions detailing the scope of feedback information to be disseminated to the Local Competent Authorities subsequent to an investigation.

4.7 NEW INITIATIVES

Computer Aided Management of Emergency Operations

Several computer based emergency planning tools to facilitate emergency planning and response in Ireland are currently being evaluated. One example of these is the **CAMEO APELL** system which is currently being considered by the Southern Health Board. The **CAMEO** (Computer - Aided Management of Emergency Operations) **APELL** (Awareness and Preparedness for Emergency at Local Level) programme is designed to provide regional governments with a tool to manage information about hazardous substances in or near their communities and to help emergency teams plan for the safe handling of chemical accidents. It was developed by the **Chemical Emergency Procedures and Prevention Office** of the US

Environmental Protection Agency (EPA) in co-ordination with the **Hazardous Materials Response Branch** of the **National Oceanic and Atmospheric Administration (NOAA)** and the **Industry and Environment Office** of the **UN Environment Programme (UNEP)**.

Such systems organise information on hazardous materials so that it may be used for developing emergency plans. The user may record and store information on topics such as the following:

- Facilities storing/using hazardous chemicals
- Transportation of hazardous chemicals
- Contacts associated with emergency planning and response
- Resources for emergency response i.e. suppliers of equipment, medical resources etc..
- Specific populations in the area and their locations including specific risk gaps requiring special attention
- Evacuation information
- Shipping firms transporting hazardous materials in specified areas
- Citizens requests for information.

The system should hold information on all commonly transported hazardous chemicals. The data requirements include chemicals names, synonyms, trade names, identification numbers and labelling conventions. For each chemical there must be easy and quick access to information describing the chemicals properties, hazards and how to deal with them in an emergency.

For each facility all necessary emergency planning information should be stored. In addition, scenarios should be created and stored for incidents and releases at specific facilities. Site plans should be discussed to indicate such things as the storage of hazardous materials. In terms of transport, data on when, where and how dangerous substances are transported in an area by road, rail, pipelines and waterways should be assembled.

It is recommended that the EC consider the development of a system for computer aided management of emergency planning which conforms to the requirements of the EC emergency planning legislation. It is possible that an existing system such as CAMEO APPELL may be modified to suit EC requirements.

5. CONCLUSIONS

5.1 INTRODUCTION

The scope of this study has encompassed the following:

- a comprehensive review of the emergency planning structure in Ireland,
- an analysis of specific accidents to highlight specific positive and negative issues which may be useful to emergency planners and industry,
- recommendations and lessons learnt have also been included where relevant.

The strategy for emergency planning and response accidents involving dangerous substances in Ireland is based on the MEP Framework. As described in Section II, the theory behind the Major Emergency Planning Framework involves the preparation of a MEP based on local hazard and resource assessments, evaluation and testing of the plan via exercises and updating of the plan, as required, in an iterative process. Mandatory emergency planning provisions specified under the "Seveso Regulations" are developed and cross referenced to the MEP. All the plans should be co-ordinated and integrated throughout all stages of design and modification.

The main lessons learnt throughout the entire emergency planning and response lifecycle have been summarised in terms of:

- policy,
- emergency pre-planning,
- accident response,
- information dissemination to the public and media,
- post accident.

5.2 POLICY

The concept of the Major Emergency Planning framework is seen to be efficient. However it is recommended that certain aspects be formalised where suitable, without inhibiting the essential flexibility of the system. One aspect of this is the formalisation of emergency services planning organisation structures solely devoted to emergency planning. In particular some sources believe there is a requirement for a single independent body to guide and monitor the Major Emergency Planning Framework to ensure that the theoretical Framework, of inter-organisational co-ordination of emergency planning and response, is effective in practice.

5.3 EMERGENCY PRE-PLANNING

The design of emergency procedures must be such that the content and quality ensure an effective, suitable and rapid emergency response. All emergency planning provisions must be comprehensive, clear and rehearsed. The importance of consultation with all relevant organisations at all pre-planning stages is stressed to ensure an integrated, co-ordinated response.

Specific essential components of emergency planning and associated recommendations are

highlighted in Section IV for all organisations involved in emergency planning, for both fixed installations and the transport of dangerous substances.

5.4 ACCIDENT RESPONSE

The information at the scene of an accident must be as comprehensive as possible to enable the senior officers to make the most suitable and rapid decisions concerning emergency response. The emergency response provisions must facilitate a rapid, effective implementation of the emergency operations.

Computer aided management tools, facilitate emergency planning preparation as well as managing the information at the scene of an emergency. Such tools greatly aid the determination of emergency response strategies. The integration of suitable computer aided management tools to facilitate all stages of emergency planning and response is currently being investigated in Ireland and is strongly recommended.

Overall communications, coordination and control play a major role at each stage of the emergency planning and response life cycle. In particular, effective control and communications structures must be quickly established in an emergency situation in order to ensure a co-ordinated, efficient and rapid response.

5.5 INFORMATION DISSEMINATION TO THE PUBLIC AND MEDIA

Programmes for information dissemination must exist prior, during and subsequent to emergencies situations. This is an area which should not be underestimated. Provisions must be arranged for managing the media and public as well as keeping them informed. Section 4.5 highlights recommendations, for the content of communication programmes, the mechanisms of dissemination and target audiences.

5.6 POST ACCIDENT

Appropriate analysis, investigation, reporting, feedback and follow-up are essential post accident activities. All lessons learnt should be documented and circulated to all agencies involved in the emergency planning process. Formal mechanisms should be developed to ensure this feedback occurs within as wide a scope as necessary. These lessons should be used where relevant to improve the emergency planning and response system to prevent similar accidents occurring in the future.

Commercial confidentiality requirements may hinder communications mechanisms such as post accident feedback. It is recommended that commercial confidentiality requirements are clearly defined such that the necessary flow of information relevant to organisations involved in emergency planning is understood and is not in any way obstructed.

APPENDIX

APPENDIX 1 GLOSSARY OF TERMS

ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
BA	Breathing Apparatus
BPM	Best Practicable Means
CEFIC	European Council of Chemical Manufacturers Federation
DCF	Data Collection Form
EC	European Community
FIC	Federation of Irish Chemical Industries
HSA	Health and Safety Authority
IATA	International Air Transport Authority
ICAO	International Civil Aviation Organisation
IMDG	International Maritime Dangerous Goods Code
IMES	Irish Marine Emergency Service
MEP	Major Emergency Plan
MPRT	Marine Pollution Response Team
PDA s	Pre-Determined Arrangements
Tremcard	Transport Emergency Card

APPENDIX 2 REFERENCES

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Department of the Environment, (1992). **Planning for Major Emergencies.** Department of the Environment, September 1992.

APPENDIX 3 INFORMATION SOURCES

List of Information Sources for the Study

Health and Safety Authority (HSA)

Dr. P.J. Claffey	Process Industries Unit, Dublin
Mr. Micheal Flynn	HSA, Cork
Mr. J.P. Goulding	Process Industries Unit, Cork
Mr. Tom O'Donnell	HSA, Cork
Mr. Pat O'Halloran	Dangerous Substances Group, Dublin
Mr. Micheal O'Hart	HSA, Sligo

Department of the Environment

Mr. Frank Donohue	Fire and Emergency Services
Ms. Eileen Hughes	Fire and Emergency Services
Mr. Brian Murnane	Assistant Principal Officer Fire and Emergency Services

Department of Health

Mr. Frank Ahern	Principal Officer Department of Health
Mr. Larry O'Reilly	Hospital Services Division

Regional Health Boards

Mr. Sean Hurley	Chief Executive Officer Southern Health Board
Mr. Patrick O'Riordan	Technical Services Mid-Western Health Board
Capt. Brian Phelan	Chief Ambulance Officer Southern Health Board

Local Authorities

Fire Services

Mr. Hugh Corrigan	Chief Fire Officer Kilkenny Fire Services
Mr. Liam Curran	Chief Fire Officer Donegal Fire Brigade
Mr. P. Forkan	Chief Fire Officer Leitrim County Council
Mr. M. Hessin	Assistant Chief Fire Officer Cork County Council
Mr. Liam V. Malone	Drogheda Fire Officer Drogheda Corporation Fire Brigade
Mr. Dennis O'Mahony	Chief Fire Officer Cork Corporation Fire Brigade
Mr. Gerr Malone	Chief Fire Officer Cork County Council Fire Brigade

Environmental Engineers

Cork County Council
Leitrim County Council

Garda Siochana

Superintendent J. Canning	Branch Services, Traffic Section Garda Siochana
Chief Superintendent B. Garvey	Garda Siochana Commissioners Office Garda Headquarters
Sergeant John Gillan	Branch Services, Traffic Section Garda Siochana
Superintendent D. J. O'Sullivan	D Branch Services, Traffic Section Garda Siochana

Department of Transport, Energy and Communications

Mr. J. V. Feehan	Railway Inspecting Officer
Mr. Tom Tobin	Road Transport
Mr. Patrick White	Aeronautical Operational Services

Department of the Marine

Capt. Livingston	Irish Marine Emergency Services
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Harbour Authorities**Relevant Manufacturers****Other Organisations**

Dr. Clive Cathcart	Director, Chemical Industries Group Federation of Irish Chemical Industries
Poisons Information Centre	Beaumont Hospital
Mr. Paddy Dunn	Safety Officer JET OIL
Dick Tracey	Safety Officer Bell Lines (transportation company)

APPENDIX 4 GENERIC OUTLINE OF INFORMATION ON EMERGENCIES REQUESTED

Generic Outline of the Information on Emergencies Requested

The generic outline below represents the scope of information researched for the study. This generic outline was customised to suit the specific responsibilities of the respective organisations/individuals from whom information was requested. For example, the company involved in a "major accident" was asked for information on the on-site emergency plans and information provided to the public whereas the Local Authority was asked for information on the off-site emergency plans prepared. All restrictions due to confidentiality have been respected while obtaining this data.

Fixed Installation Accidents

- A. Organisational structure and responsibilities** of the organisations responsible for emergency planning and accidents involving dangerous substances.(e.g. Dept. of Environment, Dept. of Health, Dept. of Justice, Local Authorities, HSA, industry, etc...)
- B. Pre-Emergency Planning** for industrial activities falling under either the general/specific emergency planning responsibilities of the Irish legislation implementing Directive 82/501/EEC.
 - 1. provisions of a specific emergency plan format/model used
 - 2. provisions of an emergency plan prepared (e.g. on-site and off-site plan) for the industrial site
 - 3. details of any safety information made available to the public (where relevant)
- C. Relevant incident/accident descriptions**
 - 1. general description of any relevant incidents/accidents
 - 2. dangerous substances involved
 - 3. extent of damage/loss
 - 4. when and how emergency measures were taken on and off-site
 - 5. list of emergency services involved and the major actions they performed
- D. Information dissemination to the public** during the incident/accident (where relevant)
 - 1. details of information provided and when
 - 2. method of communication used
 - 3. management of the press and media
- E. Post Accident Actions** taken
 - 1. details of post accident actions performed
 - 2. details of the actions taken by the Emergency Services
- F. Lessons learnt/Evaluation of the emergency planning** during and after accident
 - 1. pre-planning: details of the suitability and efficiency of any emergency plans (on/off-site) during and after the incident. Comment on any changes that you would make to future plans or the pre- planning procedure
 - 2. comment on the suitability and accessibility of emergency planning information available at the scene of the incident such that the most appropriate emergency response may be implemented as quickly as possible.

3. during/post incident/accident
 - a. comments on the success/efficiency of the emergency measures implemented on-site and/or off-site
 - b. comments on the coordination between the emergency services, expert resources, others resources and the company involved
 - c. comment on the efficiency of the role of the emergency services
4. information provided to the public and media (where relevant)
 - a. comments on the suitability of the information during the incident
 - b. comments on the efficiency of the method of dissemination
5. comments on the suitability/efficiency of the emergency planning requirements under the current legislation implementing the Seveso Directive. Comment on any changes you feel would improve emergency planning.
6. comments on any other post-accident conclusions regarding emergency planning. Highlight any positive or negative aspects not already covered above.

Transport Accidents

A. Organisational structure and responsibilities of the organisations responsible for emergency planning and accidents involving the transport of dangerous substances (Dept. of Transport, HSA, Dept. of Marine, Irish Road Haulage Association, Industry (Bell Lines) etc...)

B. Pre-Emergency Planning for the transport of dangerous substances:

1. provisions of a specific emergency plan format for:
 - a. packaging design
 - b. labelling
 - c. identification of contents and potential risks
 - d. actions to be taken in emergencies e.g. data on Tremcards
 - e. driver training
 - f. protection against collision damage
 - g. protection and safety equipment
 - h. routing
 - i. compatibility with other chemicals
 - j. spacing requirements during transport
2. details of any further emergency planning provisions specific to road, rail, sea or air transport respectively
3. details of pre-emergency exercises or practices for transport accidents
4. provisions for terrorist actions involving the transport of dangerous substances
5. details of any safety information made available to the public (where relevant)

C. Relevant incident/accident descriptions for transport accidents involving dangerous substances

1. general description of any relevant incidents/accidents
2. dangerous substances involved
3. extent of damage/loss
4. when and how emergency measures were taken on and off-site
5. list of the Emergency Services involved and details on the major actions taken by them in the transport accidents involving dangerous substances to be analysed for this study.

D. Information dissemination to public during the incident/accident (where relevant)

1. details of information provided and when
2. method of communication used
3. management of the press and media

E. Post Accident Actions taken

1. details of post accident actions performed
2. emergency services involved and the actions taken

F. Lessons learnt/Evaluation of the emergency planning during and after the transport accident/incident

1. pre-planning: details of the suitability and efficiency of any emergency plans during and after the incident e.g. comment on whether the information provided at the accident scene (on Tremcards, HAZCHEM etc...) is, in practice, most suitable for a quick and efficient initiation of the appropriate emergency response. Comment on any changes that you would make to future plans or the pre-planning procedure
2. during/post incident/accident
 - a. comments on the success/efficiency of the emergency measures implemented on site and/or off-site
 - b. comments on the coordination between the emergency services, expert resources, other resources and the company involved
 - c. comment on the efficiency of the role of the emergency services
3. information provided to the public and media (where relevant)
 - a. comments on the suitability of the information during the incident
 - b. comments on the efficiency of the method of dissemination
4. comments on the suitability/efficiency of the emergency planning requirements under the current legislation e.g. the Dangerous Substances Act and Regulations and the EC (Dangerous Substances) Classification, Packaging and Labelling Regulations. Comment on any changes you feel would improve emergency planning.
5. comments on any other post-accident conclusions regarding transport emergency planning. Highlight any positive or negative aspects not already covered above.

APPENDIX 5 EMERGENCY EXERCISES: CHEMICAL SPILL SCENARIO

CHEMICAL SPILL - EVACUATION

Scenario

This scenario package includes assumed conditions, a narrative, eight major events, and detailed events with possible anticipated actions.

Assumed Conditions

The exercise simulates decisions made at a chemical plant security site with personnel from both the plant and emergency services, controller(s) of operations on site, and a co-ordinating group remote from the site (if established).

The objectives of this scenario include testing, assessing, evaluating, or practicing the following emergency activities:

- Co-ordination between chemical plant security and local emergency services
- Warning and/or communications link between chemical plant and public
- Establishment of emergency communications from site to emergency services' central controls
- Major Emergency Plan activation
- Evacuation transportation assignments and routing
- Traffic control assignments
- Medical co-ordination
- Decontamination
- Care and shelter of evacuees

CHEMICAL SPILL - EVACUATION

Narrative

The Acme Chemicals Plant is located in an urban setting bordering an industrial area and adjacent to a residential area.

At 10.15 am a plant worker accidentally drives a forklift, with forks in the "up" position, into the side of a tanker truck containing chlorine. This causes a rupture of the vessel and a subsequent liquid chlorine spill. The forklift driver becomes a casualty due to contact with the liquid chlorine and prolonged exposure to the chlorine contaminated atmosphere. Several workers attempt to rescue the driver but are unable to do so because of the intensity of the chlorine spill and suffer from chlorine exposure. Other workers vacate the area and notify plant security of the incident.

Upon arriving at the scene, the security officer recognises that a severely hazardous situation exists, sounds the plant alarm and begins evacuating the immediate plant areas surrounding the accident site. The fire brigade is notified of the incident.

The fire brigade mobilises the pre-determined attendance for the plant to the incident. Upon verification of the incident and a determination of its severity other appropriate agencies are notified including the Garda Síochána, Civil Defence and the Ambulance Service.

The Chief Fire Officer arrives on scene, realizes the situation far exceeds his service's capabilities, and activates the Major Emergency Plan.

A Danger Area is set out by the CFO and Control and Holding Areas established. It is now 11.07 am.

MAJOR EVENTS

1. Accident Reported
2. Emergency Services Response
3. Activation of Major Emergency Plan
4. Initial Command Activities
5. Schools in evacuation area request assistance
6. Evacuation route congestion
7. Medical effects
8. Care and shelter of evacuees

DETAILED EVENTS

Major Event: Accident reported

<p>Plant personnel advise plant security office that incident has occurred</p> <p>Security officer investigates incident</p> <p>Chlorine liquid spill and subsequent vapor cloud covering entire area immediately surrounding tanker truck</p>	<p>Should lead to investigation and assessment of reported incident</p> <p>Could lead to further actions such as activation of plant alarm, call for emergency services assistance, plant emergency procedures activation, full or partial plant evacuation</p> <p>Should lead to security officers' decision to evacuate immediate area and call for additional assistance (plant emergency team, emergency services, etc.)</p>
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Exercise Director

<p>Scenario requires that at this point warning of dangerous situation must be given</p> <p>Plant warning system activated</p> <p>Plant emergency team responds to incident</p>	<p>Decision required. Add further events as necessary to make certain warning system activated</p> <p>Should lead to activation of plant emergency procedures, i.e. notification of fire brigade, plant emergency team, evacuation of immediate area or other appropriate actions</p> <p>Should lead to assessment of incident and ability to plant personnel to contain incident. Could lead to initiation of plant personnel actions or call for emergency services assistance</p>
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Exercise Director

<p>Scenario requires that at this point incident is of such severity that plant personnel unable to control or contain incident</p> <p>Plant emergency team determines they are unable to contain incident</p>	<p>Decision required. Add events to ensure this criteria is met</p> <p>Should lead to call for emergency services assistance. Could lead to other emergency measures by plant emergency team such as evacuation assistance for immediate plant area, etc.</p>
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Major Event: Emergency Services Response

Plant security notifies fire brigade of incident and injuries incurred	Should prompt dispatchment of pre-determined attendance according to standard operating procedure of fire brigade
Fire alarm and communications dispatches assignment	Should provide immediate emergency assistance, evaluation of hazard, etc. Could lead to call for additional assistance from outside agencies
Ambulance service notified of reported injuries	Should provide immediate response to incident site
Officer of first attendance fire unit unable to determine incident location from security officer at plant entrance	May result in establishment of a preliminary control point at the plant entrance and establishment of a communication and information system to direct/monitor operations to eliminate further confusion
First attendance officer reports extensive product spill and subsequent vapor cloud	Could result in call for additional evacuation, additional fire tenders, additional assistance from other agencies, etc.
Confusion prevalent in initial plant evacuation of immediate areas	Could result in initial fire department in this operation
Fire brigade crews focus on evacuating employees from affected area	Should result in more orderly and quicker evacuation of affected plant areas
Liquid spill and subsequent vapor cloud continues to increase in size	Could result in call for additional fire tenders or other agency assistance
Emergency personnel report. Numerous cases of exposure to chlorine	Should result in alert of area hospitals, increased Health Board response
Fire chief calls for activation of Major Emergency Plan	Should result in actions by local government agencies to begin emergency procedures as per Major Emergency Plan

Major Event

<p>Activation of Major Emergency Plan</p>	<p>Should result in response to Major Emergency Plan by appropriate representatives from various agencies as per Major Emergency Plan</p>
<p>Danger Area and Control Area established on site</p>	<p>Should establish center for control of emergency operations effecting a coordinated approach to the handling of the incident</p>
<p>Controller(s) of Operations establish(es) holding areas</p>	<p>Should result in central locations for all personnel, equipment, and appropriate services to assemble for dissemination of services</p>
<p>Major Emergency Plan becomes operational</p>	<p>Representatives from appropriate agencies now in attendance</p>
<p>Senior personnel from main emergency response agencies briefed on incident</p>	<p>Should result in an understanding of situation currently encountered</p>
<p>Controller(s) of Operations request(s) additional personnel and logistics support</p>	<p>May result in response of additional emergency services units, response of (e.g.) Civil Defence and other appropriate agencies' support. Could require call for mutual aid assistance from neighbouring authorities and/or call-in of off duty personnel Should result in establishment of Co-Ordinating Group at designated HQ</p>
<p>Controller/CFO contacts plant engineers and requests advice</p>	<p>Should provide technical advice pertaining to the product and for control of the incident</p>
<p>Meteorological Office contacted</p>	<p>Should result in determination of wind direction, dew point and precipitation probability, and other factors that may influence the emergency.</p>
<p>Wind direction may cause chlorine cloud to be carried into populated areas</p>	<p>Should prompt Controller/CFO to determine whether populated areas surrounding plant should be evacuated</p>
<p>It becomes apparent that chlorine cloud is moving toward populated area</p>	<p>Should prompt evacuation order</p>

Exercise Director

<p>Scenario requires that order to evacuate be given at this time</p> <p>Evacuation begins</p> <p>Numerous pets and livestock found in area to be evacuated. Crews request instructions on whether they should be evacuated</p>	<p>Decision required. Add events to ensure that order is given</p> <p>May be accomplished with door to door operations by emergency personnel, use of loud speakers on emergency vehicles and/or use of broadcast media</p> <p>Should prompt consideration and decision on this issue</p>
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Major Event- Schools in evacuation area request assistance

<p>Area schools seek advice on transportation and location of hospital shelters</p> <p>Traffic congestion at schools by anxious parents prevent buses from arriving</p> <p>School switchboards swamped by parents seeking location of children</p> <p>Congestion on evacuation route for buses</p> <p>Some buses low on fuel</p>	<p>Indicates evacuation order being received. Should prompt action on dispatching buses to schools and advising drivers of destination and routes</p> <p>Indicates immediate need for traffic control at schools</p> <p>Should prompt public announcement of relocation area for schools</p> <p>May require additional traffic control or escort for buses</p> <p>Rapid allocation of available fuel necessary. Mobile tanker for on-scene refuelling may be required</p>
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Major Event- Evacuation route congestion

<p>Traffic moving too slowly for effective evacuation</p> <p>Wind direction is shifting and may lead to closing of primary evacuation route</p>	<p>May indicate need for additional traffic control on evacuation route, use of alternate routes may be considered. Due to large number of persons in cars, radio broadcasts may be used for additional information dissemination.</p> <p>Indicates immediate decision may be necessary. Meteorological Office should be contacted for additional information.</p>
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Exercise Director

Scenario requires that primary evacuation route be closed at this time	Exercise has determined that it wants primary route closed. If decision is not made, force it with spontaneous messages
Scenario requires that broadcast instructions change to order secondary evacuation route	Exercise wants to test ability to change to secondary route
Traffic moving smoothly on secondary route	Indicates message to change received and progressing effectively
Fire brigade advises that persons have been located in evacuation area with no transportation	Should prompt dispatch of personnel to assist in evacuation. Could also prompt intensive search of area for others left behind
Traffic minimal on evacuation route	Indicates that evacuation is almost complete. Could prompt release of traffic control personnel for other duties, such as looting prevention.

Major Event- Medical Effects

Hospital adjacent to evacuation area reports overflow of patients with respiratory distress from chlorine	May require Co-Ordinating Group to allocate ambulances, buses and other vehicles to transport patients to other facilities. Could lead to dispatch of medical personnel from other facilities to assist
Primary shelter reports large numbers of persons arriving with respiratory distress	Immediate medical assistance needed, vehicles needed to transport victims to medical facility and/or dispatch medical team to shelter
Fuel for hospital emergency generator running low	Allocation of available fuel needed. Should prompt check of other facilities using emergency generators to ascertain fuel levels
Evacuation of water treatment plant leads to lack of sanitary water supplies in some areas outside evacuation area	Indicates need for distribution of potable water supplies and provision for sanitary sewer facilities. Possible use of portable toilets
Phone report that large numbers of animals have died at kennel in evacuation area	Might prompt dispatch of crew to dispose of dead animals in order to prevent sanitation problem.
Vehicle accident reported on evacuation route with multiple injuries	Possible dispatch of fire brigade and ambulance unit or preliminary treatment by traffic officers on scene. Transportation for uninjured passengers may be needed

Risk area hospital asks for transportation to assist in release of non-critical patients

Could prompt use of mass transit vehicles. Controller or Co-ordinating Group may advise hospital to delay release until more opportune time.

Major Event- Care and Shelter of Evacuees

<p>Large numbers of persons seeking relatives at relocation shelters</p>	<p>Indicates need for accurate lists of persons in shelters. May prompt formation of missing persons team</p>
<p>Food supplies low at relocation shelter</p>	<p>Indicates need for allocation of available food to areas where needed, may lead to search for supplies and arrangements for cooking (e.g. Civil Defence, Army)</p>
<p>Evacuees at shelters seek facilities to phone relatives to advise that they are safe</p>	<p>Could lead to contact with Telecom Eireann to establish temporary phone service</p>
<p>Primary shelter reports many evacuees have only the clothing they are wearing</p>	<p>Possible need to provide some clothing, based on weather conditions and length of stay anticipated</p>
<p>Number of evacuees has outstripped primary shelters ability to provide food service</p>	<p>Could prompt dispatch of volunteer organisation to assist. Use of commercial food establishment may be considered</p>
<p>Garda Siochana in host area unable to provide personnel needed to maintain civil order and traffic control</p>	<p>Could result in transfer of Gardai from risk area or provision of reinforcements from adjacent area</p>

APPENDIX 6A INFORMATION TO BE INCLUDED IN A NOTIFICATION
(Based on the Fifth Schedule Part I to the Regulations)

1. The name (including any registered business name) of the manufacturer together with the address of the establishment and the address of the registered place of business.
2. The following information relating to substances specified in Annexes II and III to the Directive which are set out in the Second and Third Schedules, respectively:
 - (a) the data and information specified in Annex V to the Directive which is set out in Part II to this Schedule and relates to the supply of data and information in connection with a notification provided for in Article 5 of the Directive,
 - (b) a brief description of the hazards which may be created by the substances including immediate and delayed effects for man and for the environment,
 - (c) the stage of the activity in which the substances are or maybe involved.
 - (d) the chemical and physical behaviour of the substances under normal conditions of use in the industrial activity, and
 - (e) any other substances whose presence could have an effect on the potential hazard presented by the industrial activity.
3. The following information relating to the establishment:
 - (a) a map of the establishment and its surrounding area to a scale large enough to show any features that may be significant in the assessment of the hazard or risk associated with the establishment,
 - (b) a scale plan of the establishment showing the locations and quantities of all significant inventories of the dangerous substance,
 - (c) a description of the process or storage involving the dangerous substance and an indication of the conditions under which it is normally held,
 - (d) the maximum number of persons likely to be present at the establishment,
 - (e) information about the nature of the land use and the size and distribution of the population in the vicinity of the establishment, and
 - (f) a general description of the technological processes used at the establishment.
4. The following information relating to the management of the industrial activity:
 - (a) the staffing arrangements for controlling the industrial activity with the name of the person responsible for safety at the establishment and the names of those who are authorised to implement emergency procedures and to inform the relevant competent authorities of such implementation,
 - (b) the arrangements made to ensure that the means provided for the safe operation of the industrial activity are properly designed, constructed, tested, operated, inspected and maintained, and that the technical means necessary to deal with any malfunctions that arise are available at all times, and
 - (c) the arrangements for training of persons working at the establishment.
5. The following information relating to the possible major accidents:
 - (a) a description of the possible sources of a major accident and the conditions or events which could be significant in bringing one about,

- (b) a diagram of any plant in which the industrial activity is carried on, sufficient to show the features which are significant as regards the potential for a major accident and its prevention or control,
- (c) a description of the measures taken to prevent, control or minimise the consequences of any major accident including methods available for rendering dangerous substances harmless in the event of accidental dispersion,
- (d) information about the emergency procedures laid down for dealing with a major accident occurring at the establishment including details of safety equipment, alarm systems and resources available,
- (e) information about prevailing meteorological conditions in the vicinity of the establishment and sources of danger arising from the location of the site,
- (f) an estimate of the number of people at the establishment who may be particularly exposed to the hazards considered in the report,
- (g) information relating to the nature, extent, and likely effects outside the establishment of possible major accidents, and
- (h) information relating to situations where substances may be transformed into dangerous substances in the case of abnormal conditions which can be foreseen.

APPENDIX 6B INFORMATION PACKAGE FOR THE SAFETY OF THE PUBLIC

The contents of the information package as amended by S.I. 21 of 1992 (to account for the amended Directive 82/501/EEC - Annex VII) is as follows:

- name of manufacturer and site address,
- identify person giving information,
- confirm that the site is subject to the "Seveso Regulations" and that the Competent Authority has been notified,
- simple explanation of site activity,
- common names and characteristics of relevant dangerous substances,
- general information on the nature of the accident hazard and its effects on man and the environment,
- information on how the population will be warned and informed, what actions to be taken and the behaviour they should adopt,
- confirm that the manufacturer makes on-site arrangements including their liaison with the emergency services to deal with accidents and minimise their effects,
- reference off-site emergency plan,
- location of further information subject to confidentiality.

APPENDIX 7 A TRANSPORT OF DANGEROUS SUBSTANCES

Certification

The contents to be included in the certificate is as follows:

- (i) A statement that the substance is in proper condition for transport and that all the relevant provisions of the Regulations have been complied with by the consignor;
- (ii) the name and address and telephone number of the consignor;
- (iii) the name of each substance being consigned;
- (iv) the weight of each substance;
- (v) details of the route to be followed;
- (vi) clear information on the nature of the dangers inherent in each substance being conveyed and the safety measures to be taken to deal with those dangers;
- (vii) the action to be taken and treatment to be given to persons coming into contact with or being exposed to the substance;
- (viii) the action to be taken in case of fire including the appropriate fire extinguishing agents to be used;
- (ix) the measures to be taken in the event of a spillage, and
- (x) instruction on the proper use of personal protective equipment and respiratory protective equipment provided.

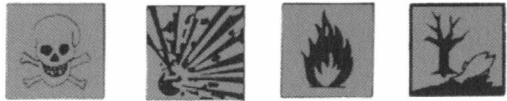
The information in paragraphs (vi) to (x) above is available in Tremcards published by CEFIC. If the appropriate Tremcard is attached to the Certificate, the Regulation is complied with.

EC PACKAGE LABELLING SYSTEM HAZARD WARNING LABELS CONT.

(Supply and Conveyance)



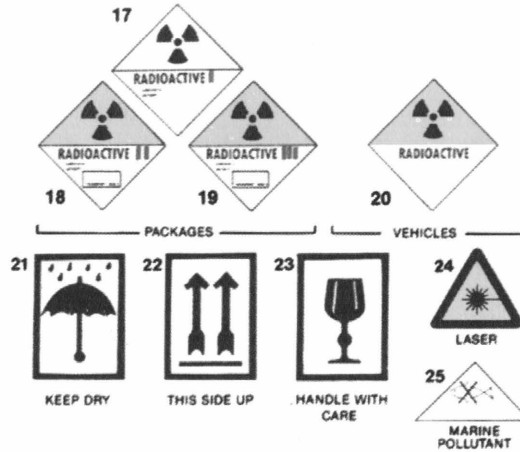
OXIDIZING CORROSIVE HARMFUL/IRRITANT



TOXIC/VERY TOXIC EXPLOSIVE HIGHLY/EXTREMELY FLAMMABLE POLLUTANT

SAMPLE EC LABEL

SODIUM HYPOCHLORITE	
	CORROSIVE
CONTACT WITH ACIDS LIBERATES TOXIC GAS CAUSES BURNS	Keep out of reach of children. After contact with skin, wash immediately with plenty of water.
COMPANY NAME ADDRESS	Emergency Telephone Only Telephone Number



NOTES

Labels 5, 6, 9: The symbol (cylinder, flame) may be black or white.

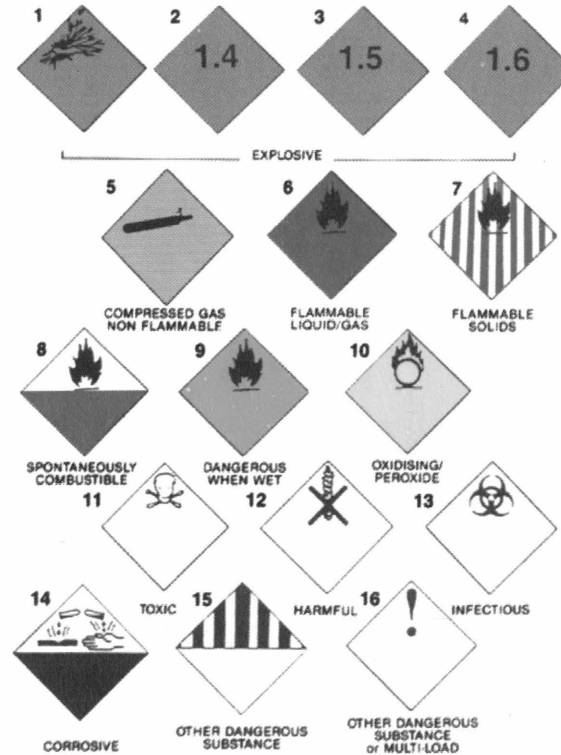
Label 22: May be red on white.

Page 1: United Nations Labels are internationally recognised and included in the Hazchem label and used in conjunction with ADR, RID label. They are also used for Air (ICAO, IATA) and Sea Transport (IMO).

Page 2/3/4: Both the Hazchem label and the European ADR label are approved for road tankers.

Page 5/6: This EC system is used for packages or containers i.e. small quantities.

EMERGENCY SERVICES HAZARD WARNING LABELS



SAMPLE HAZCHEM LABEL



NOTES FOR GUIDANCE

FOG

In the absence of fog equipment a fine spray may be used

DRY AGENT

Water must not be allowed to come into contact with the substance at risk.

V

Can be violently or even explosively reactive.

FULL

Full body protective clothing with BA

B.A.

Breathing apparatus plus protective gloves.

DILUTE

May be washed to drain with large quantities of water. However due care must be taken to avoid unnecessary pollution of water courses.

CONTAIN

Prevent, by any means available, spillage from entering drains or water course.

E

Consider evacuation, but depending on nature of incident, it may be safer to keep people in doors.

Interpretation of The Emergency Action Code

- 1 WATER JETS
- 2 WATER FOG
- 3 FOAM
- 4 DRY AGENT

P	V	FULL	DILUTE	
				S
BA for FIRE only				
T	V	BA		
		BA for FIRE only		
W	V	FULL		CONTAIN
		X		
BA for FIRE only				
Z	V	BA		
		BA for FIRE only		
E			CONSIDER EVACUATION	

**SAMPLE EUROPEAN IDENTIFICATION LABEL
ADR (ROAD) RID(RAIL)**



Either or both labels may be displayed on vehicles. The plain label indicates a dangerous substance is being transported. The coded label gives additional information viz:-

HAZARD IDENTIFICATION NUMBER (Upper Part - 2 or 3 figures)

The hazard identification number consists of two or three figures.

In general, the figures indicate the following hazards:

- 2 Emission of gas due to pressure or to chemical reaction.
- 3 Flammability of liquids (vapours) and gases.
- 4 Flammability of solids.
- 5 Oxidizing (fire-intensifying) effect.
- 6 Toxicity.
- 7 Radioactivity.
- 8 Corrosivity.
- 9 Risk of spontaneous violent reaction.

Doubling of a figure (e.g. 22, 33) indicates an intensification of that particular hazard.

Where the hazard associated with a substance can be adequately indicated by a single figure, this is followed by a zero.

Some combinations of figures have a special meaning, e.g. :-

- 22—Refrigerated gas
- X333—Spontaneously inflammable liquid which reacts dangerously with water
- X423—Inflammable solid which reacts dangerously with water emitting inflammable gases.
- 44—Inflammable solid in the molten state at an elevated temperature.
- 539—Inflammable organic peroxide

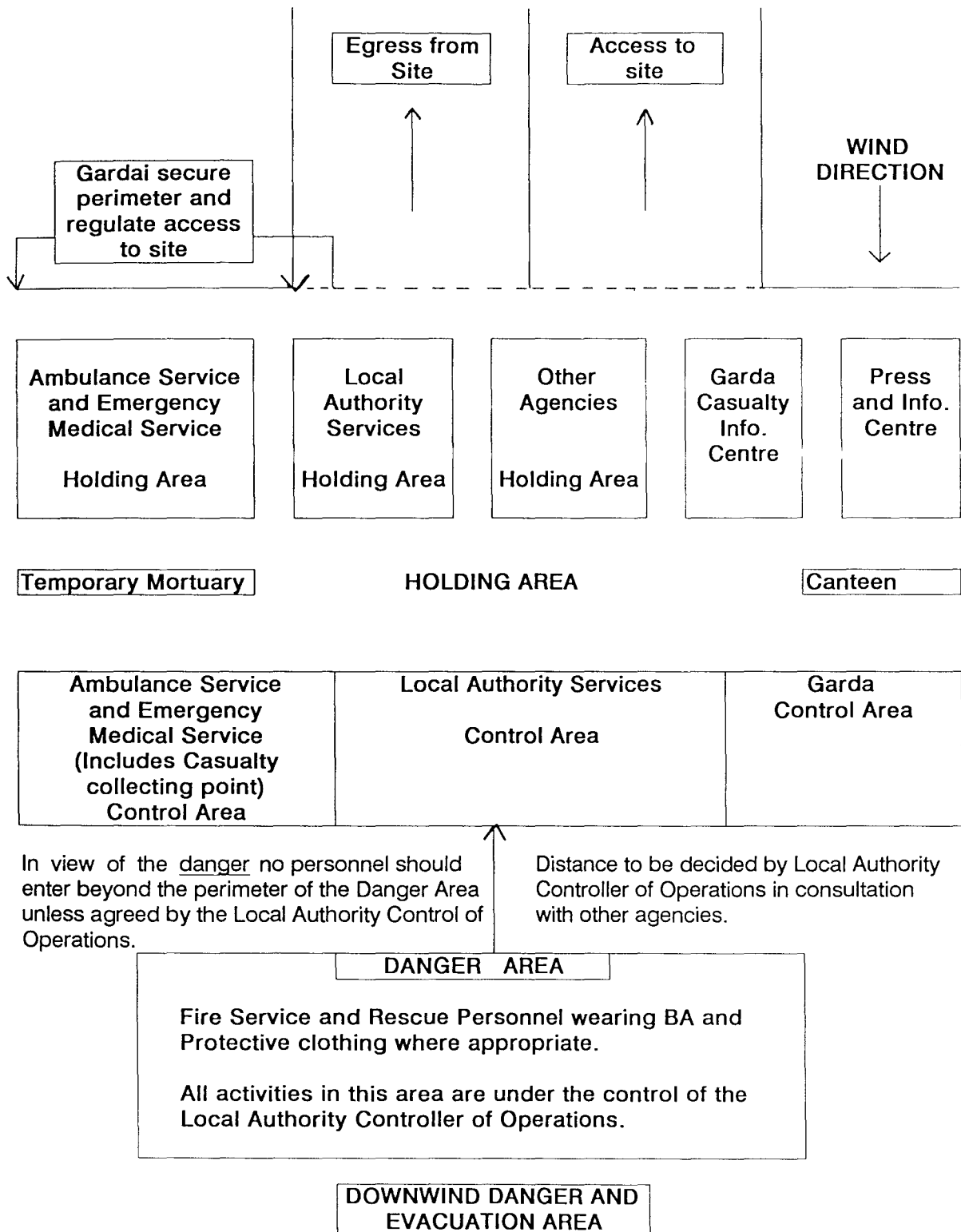
If a hazard identification is prefixed by the letter "X" this indicates that the substance will react dangerously with water.

SUBSTANCE IDENTIFICATION NUMBER (Lower Part - 4 figures)

Identifies the particular substance involved.

APPENDIX 8 LAYOUT FOR THE SITE OF A MAJOR EMERGENCY

Recommended Layout for the Site of a Major Emergency



APPENDIX 9 BLANK DATA COLLECTION FORM

DATA COLLECTION FORM

1. ACCIDENT DATA

Date: _____
 Time: _____
 Location: _____

Activity Type:

Transport

Nature of Activity: _____

Vehicle tachograph speed at time of accident: _____

Brief Description of Incident/Accident Type:

Explosion: _____

Fire: _____

Release/Emissions: _____

Spillage/leakage: _____

Dangerous Substances Involved:

Name	EEC Nos	UN Nos	Hazard ID Nos. (UK)	Masses Involved	Masses Released

Applicable Regulations:

Transport

ADR Signs: IMDG Signs: HAZCHEM Signs

Other Signs:

Details of content of other signs: _____

Details of any Labels: _____

Relevant Tremcards: Tremcard No: _____
Substances: _____

Emergency Procedures to be followed in the event of an accident/incident: _____

Other classification, packaging and labelling requirements: _____

Was the Driver trained?

Fixed Installation

Subject to general duties under Articles 3 & 4 of Directive 82/501/EEC:

Subject to specific duties under Articles 5, 7 & 8 of Directive 82/501/EEC:

Environmental Conditions at the site at the time of the incident:

Weather: _____

Proximity to population: _____

Likely Potential Damage/Hazard(s)

Man:

Fatalities:

Injuries:

Environment:

Air pollution:

Water pollution:

Land pollution:

Other: _____

Economic:

Property:

Agriculture (crops/livestock):

Production losses:

Traffic Congestion:

Other: _____

Actual Accident Damage

Man:

Fatalities:

Off-Site

On-Site

Injuries:

Off-Site

On-Site

Environment:

Air pollution:

Water pollution:

Land pollution:

Other:

Economic:

Property:

Off-Site

On-Site

Agriculture (crops/livestock):

Production losses:

Traffic Congestion:

Other:

2. EMERGENCY/PLANNING/PROPHYLACTIC PREPARATION:

Fixed Installation:

Emergency plans on-site:

Was there an emergency plan? Yes No

Detail the general provisions for dealing with major accidents on-site:

Detail the general criteria for calling the emergency services and their expected roles:

Local Authority:

Police:

Medical Services:

Other Services:

Emergency plans off-site:

Was there an emergency plan? Yes No

General provisions for dealing with accidents off-site:

Provisions detailing the role of the emergency services:

Details of planned co-ordination with the on-site staff and/or other Local Competent Authorities: _____

General provisions of any other emergency plans: _____

Information available to the public (where relevant)

Details of any safety information on possible accident hazards available to public:

Methods of Communication:

Transport

Were there any emergency plans/certificates/Tremcards? Yes No

Provisions of emergency information included:

3. EMERGENCY ACTION

Fixed Installation

Emergency plan performance - on-site:

When, how and by whom (title) were emergency plans activated?

Emergency Services involved and Actions taken:

Company internal emergency services:

Local Authority:

Police:

Medical Services:

Voluntary Services:

Other Services/Information Centres:

Emergency plan performance - off-site:

When, how and by whom (title) was the off-site plan activated?

Emergency Services involved and Actions taken:

Local Authority: _____

Police: _____

Medical Services: _____

Voluntary Services: _____

Other services/Information Centres: _____

Information dissemination to the public during/after the accident/incident:

Details of information: _____

Method(s) of communication used: _____

Management of press and media: _____

Transport:

Emergency plan (if any) performance:

Actions taken by the driver:

Emergency Services involved and Actions taken:

Local Authority:

Police:

Medical Services:

Voluntary Services

Other Services/Information Sources:

4. POST ACCIDENT ACTIONS TAKEN

Details of post accident actions taken:

Emergency services involved and actions taken:

Local Authority:

Police:

Medical Services:

Voluntary Services:

Other Services/Information Centres:

5. LESSONS LEARNT/EVALUATION OF EMERGENCY PLANNING

Pre-planning:

Comments on the suitability/efficiency of the emergency plans during/after the accident:

Company Comments: _____

HSA Comments: _____

Emergency Services Comments: _____

During/Post accident:

Comments on the success/efficiency of emergency measures implemented:

Company Comments: _____

HSA Comments: _____

Emergency Services Comments: _____

Comments on the co-ordination between the emergency services, expert resources, voluntary services, other resources and the company involved.

Company Comments: _____

HSA Comments: _____

Comments on the efficiency of the role of the Emergency Services:

Company Comments: _____

Emergency Services Comments: _____

Information provided to the Public and Media

Comments on the suitability of the information provided:

Company Comments: _____

HSA Comments: _____

Emergency Services Comments: _____

Comments of the efficiency of the method(s) of dissemination:

Company Comments: _____

HSA Comments: _____

Emergency Services Comments: _____

Additional Information:

Comments on the suitability/efficiency of the emergency planning requirements as defined under S.I. 292 of 1986 which implements Directive 82/501/EEC:

Company Comments: _____

Comments on other post accident conclusions regarding Emergency Planning not already covered:

Company Comments: _____

6. INFORMATION SOURCES

European Commission

**EUR 15565 – EC study - Lessons learnt from emergencies after accidents
in Ireland involving dangerous substances**

D.R. Maxwell

Luxembourg: Office for Official Publications of the European Community

1994 – 98 pp. – 21.0 x 29.7 cm

Environment Quality of Life series

ISBN 92-826-7516-5

Price (excluding VAT) in Luxembourg: ECU 16,50

The scope of the study encompasses emergency planning and response provisions for accidents in Ireland involving dangerous substances either in fixed installations subject to the requirements of the "Seveso Directives" or during transportation of dangerous chemical substances. The first part of the study is a comprehensive review of the Irish framework for emergency planning and response. The second part focuses on relevant accidents: four fixed installations and thirteen transport accidents have been selected to extract lessons on emergency preparedness and response. This reports continues the series of publication of similar studies performed for other EEC countries with the objective of improving dissemination of information for a common learning process.

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