![NSW Government Planning logo]

Hazardous Industry Planning Advisory
Paper No 1

Emergency Planning

January 2011

Foreword

Since the 1980s, the New South Wales Department of Planning has promoted and implemented an integrated approach to the assessment and control of potentially hazardous development. The approach has been designed to ensure that safety issues are thoroughly assessed during the planning and design phases of a facility and that controls are put in place to give assurance that it can be operated safely throughout its life.

Over the years, a number of Hazardous Industry Advisory Papers and other guidelines have been issued by the Department to assist stakeholders in implementing this integrated assessment process. With the passing of time there have been a number of developments in risk assessment and management techniques, land use safety planning and industrial best practice.

In recognition of these changes, new guidelines have been introduced and all of the earlier guidelines have been updated and reissued in a common format.

I am pleased to be associated with the publication of this new series of Hazardous Industry Advisory Papers and associated guidelines. I am confident that the guidelines will be of value to developers, consultants, decision-makers and the community and that they will contribute to the protection of the people of New South Wales and their environment.

SHaddad

Director General

Contents

Executive Summary

Background

The orderly development of industry and the protection of community safety necessitate the assessment of hazards and risks. The Department of Planning has formulated and implemented risk assessment and land use safety planning processes that account for both the technical and the broader locational safety aspects of potentially hazardous industry. These processes are implemented as part of the environmental impact assessment procedures under the *Environmental Planning and Assessment Act 1979.*

The Department has developed an integrated assessment process for safety assurance of development proposals, which are potentially hazardous. The integrated hazards-related assessment process comprises:

- a preliminary hazard analysis undertaken to support the development application by demonstrating that risk levels do not preclude approval;

- a hazard and operability study, fire safety study, emergency plan and an updated hazard analysis undertaken during the design phase of the project;

- a construction safety study carried out to ensure facility safety during construction and commissioning, particularly when there is interaction with existing operations;

- implementation of a safety management system to give safety assurance during ongoing operation; and

- regular independent hazard audits to verify the integrity of the safety systems and that the facility is being operated in accordance with its hazards-related conditions of consent.

The process is shown diagrammatically in Figure 1.

A number *of Hazardous Industry Planning Advisory Papers (HIPAPS)* and other guidelines have been published by the Department to assist stakeholders in implementing the process. All existing HIPAPs have been updated or completely rewritten and three new titles (HIPAPs 10 to12) have been added.

A full list of HIPAPs is found at the back of this document.

The part of the process covered by this guideline is highlighted in Figure 1.

Figure 1: The Hazards-Related Assessment Process
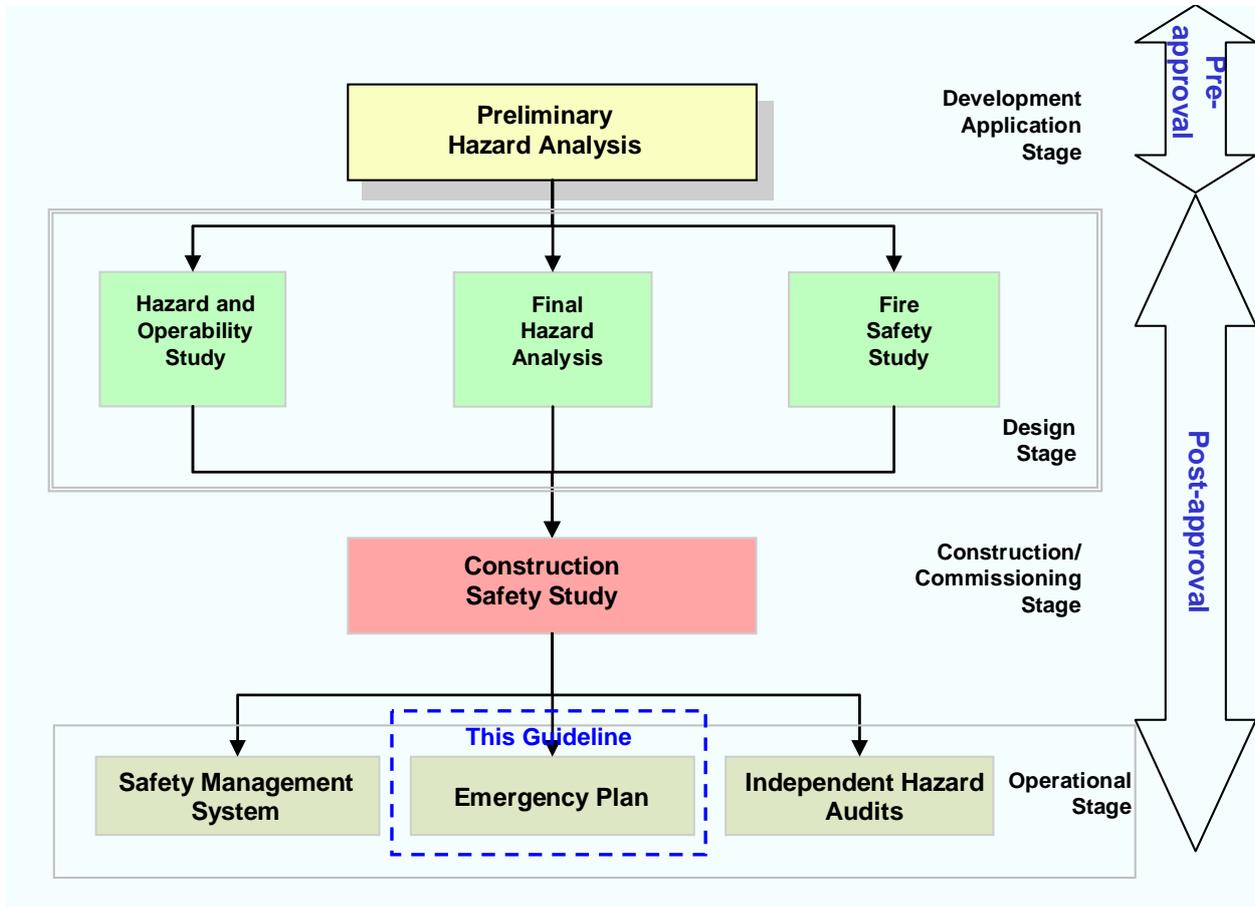
Emergency Plans

An important element of any system for the prevention of major accidents is the establishment of a site-specific emergency plan. Emergency planning seeks to minimise the effect of an accident inside and outside a facility and requires the timely application of defined procedures by personnel with adequate training and resources. For this to occur, plans and procedures specific to relevant activities at the facility must have been developed, documented and tested prior to the occurrence of an event.

This advisory paper aims to assist an operator of a facility in the establishment, maintenance, testing and review of an emergency plan that provides for the protection of people and the environment in the event of an accident. This guide is also suitable for Operators of Major Hazard Facilities to use when preparing emergency plans (see Appendix 6 for a summary of emergency planning obligations in NSW occupational health and safety legislation). The guidance has been updated in consultation with Fire and Rescue NSW[1].

By focussing on the elements contained in this advisory paper, operators of facilities should be able to develop an emergency plan that is well structured, succinct and:

- specific to the facility and the major hazards identified in a risk assessment;

- effective in addressing the consequences of a major accident both on-site and off-site;

---

[1] Formerly the NSW Fire Brigades

- integrated into the facility's Safety Management System;

- developed in consultation with employees, emergency services and people likely to be affected by the consequences of a major accident, including other closely located facilities;

- understood by employees, visitors and other people likely to be affected; and

- subject to testing, review and update at appropriate intervals.

The advisory paper is divided into five distinct sections:

- An introduction that presents the need for emergency planning at a facility;

- A section that outlines the important principles to be considered when establishing an emergency plan at a facility;

- A section on the specific issues that should be addressed when preparing an emergency plan. This includes alignment with existing emergency management arrangements, consultation, setting the context, aim and parameters of the plan, designing the response system and incorporating monitoring and review;

- A section that provides guidance on writing the emergency plan to ensure that all issues are covered and explained in a simple and clear format; and

- A section that outlines the management of the plan, including issues such as testing the plan, providing training and education and on updating the plan when appropriate.

Appendix 2 of this advisory paper provides a 33 point checklist that summarises the important components of a site-specific emergency plan and provides an assessment basis for the relevant public authorities when evaluating the completeness of emergency preparedness.

1   Introduction

SECTION SUMMARY

Emergency planning is a key component of the Department of Planning's integrated land use safety assessment framework and these guidelines focus on the importance of emergency plans in minimising the potential impacts of incidents with potential off-site consequences.

The guidelines focus on developing responses to site specific types of emergency.

Emergency plans also need to be prepared with an understanding of the emergency response role of public authorities, notably the NSW Police, Fire and Rescue NSW and the NSW Department of Environment, Climate Change and Water.

KEY MESSAGE

- Emergency plans need to be site specific as well as being compatible with the NSW statutory emergency management framework.

1.1   Background

The Department of Planning's environmental safety planning framework necessarily involves requirements for emergency planning. Emergency planning is a key prevention (mitigation) strategy and directly influences the probability of incidents escalating and the extent of their consequences. These guidelines will specifically provide the basis for compliance with the department's requirements.

The department believes that these guidelines fill an important gap in the information available to industries in plan preparation. The guidelines, however, should not be seen as the only source of information. The attention of users of this document is drawn, in particular, to the NSW *Hazardous Materials/Chemical, Biological, Radiological Emergency Sub-Plan*[2], which details the procedures for all agencies involved in combating hazardous material incidents and emergencies. The Plan is maintained by Fire and Rescue NSW in cooperation with the NSW Police, the NSW Department of Environment, Climate Change and Water (DECCW), NSW Ambulance and NSW Health. Appendix 7 lists several other documents which may be of assistance to industries in preparing their emergency plans.

The department's primary focus is on hazards and incidents with potential off-site effects. However, effective and integrated plans to deal with on-site incidents reduce the probability of such incidents escalating into off-site emergencies. These guidelines address planning for the full set of incidents which could arise on any site.

Industry plans are an essential part, but only a part, of the total emergency planning process. Where there are concentrations of hazardous industry, incident and area specific plans must be prepared. As noted in the guidelines, the industry plans must be compatible and integrated with the local emergency management arrangements adopted by the Local Emergency Management Committee (appropriate to the site's local government authority). In addition, the emergency service organisations have their own plans and procedures for responding to incidents and emergencies which are also co-ordinated by the Local Emergency Management Committee.

The department does not have an operational role in emergency response and fully acknowledges the central involvement of the emergency services, other government authorities and industry in both planning and response. The first edition of the guidelines was prepared by the Emergency Planning Subcommittee of the

---

[2]   As at the time of writing, the Plan may be found on the NSW Emergency Management website at http://emergency.nsw.gov.au/media/950.pdf.

Environmental Risk Planning Advisory Committee to the Department of Planning. The subcommittee included representatives from the NSW Police, the then Board of Fire Commissioners (now Fire and Rescue NSW), the NSW Ambulance Service, the Environmental Protection Authority and industry.

In 1992 a limited revision of the guidelines was undertaken. The main changes made related to the changes in responsibilities of some NSW authorities under the *State Emergency and Rescue Management Act 1989*.

The current guideline has been completely rewritten, based on *Emergency Planning - Guidelines for Hazardous Industry*, a joint publication of the Australia and New Zealand Hazardous Industry Planning Taskforce and the Chemical Hazards and Energy Management Unit ('the CHEM Unit') of the Queensland Department of Emergency Services. It should be read in conjunction with Fire and Rescue NSW' *Policy No. 1: Guidelines for Emergency Plans at Facilities Having Notifiable Quantities of Dangerous Goods.*

2 Emergency Planning Principles

<div style="background-color: yellow; padding: 10px;">

SECTION SUMMARY

The key requirement for any facility aiming to prepare an emergency plan is that the plan is fit for the purpose and must be properly integrated with the overall facility Safety Management System.

Interpretations of the term 'emergency' vary, depending on a person's background and experience. Each facility developing an emergency plan will need to define those circumstances that constitute an emergency for its specific operation and activities. A facility's definition of an emergency should be distinguished from, and yet complementary to, the use of the term by Police, Fire and other emergency services.

Through emergency planning, facility personnel improve their understanding of the plant, equipment, processes and materials, and their possible impacts in emergency situations.

Emergency planning should complement any existing management systems, including: safety management; environmental management; risk management; and emergency management.

KEY MESSAGE

- Emergency plans need to be both site specific and "fit for purpose."

</div>

2.1 Scope and Application of these Guidelines

The diverse nature of industries implies that the system developed by one facility to manage an emergency may not be appropriate for another facility. Even the basic definition of an emergency situation may differ from facility to facility. The level of detail necessary in the emergency plan and the degree of documentation may also vary between facilities.

The key requirement for any facility aiming to prepare an emergency plan is that the plan is fit for the purpose. It should be sufficiently comprehensive to cover the full range of activities at the facility (including non-routine activities such as maintenance or construction) that could result in an emergency situation; and should be relevant, realistic and sufficiently clear to be understood by all users and reviewers of the plan. In order to achieve this outcome, an emergency plan should be tailored for the facility to which applies. A less hazardous facility may require a simple emergency plan, while a complex or more hazardous industry may require a more detailed and extensive plan, involving more people and organisations in the development and consultation phases of the plan.

This Advisory Paper provides a basis for facilities to determine the type of emergency plan that is relevant to their needs. The paper only covers matters of immediate concern to emergency planning and makes reference to documents that provide guidance on other areas such as hazard identification and risk assessment, training and education, consultation and accident reporting and investigation. It is envisaged that the facility will have separate, but related processes to address other matters such as:

- business continuity following an emergency;
- the design and provision of protective equipment;
- the design of buildings and layout of the facility;
- land use safety planning issues; and
- environmental management systems.

The emergency plan must be properly integrated with the overall facility Safety Management System, details of which are covered in HIPAP 9. It is important that all aspects of the emergency plan are realistic, workable and agreed to by the relevant

parties. This includes assumptions regarding actions required, timing, effectiveness of detection methods, decision-making processes, etc. The emergency plan should take into account the less than ideal conditions that may prevail in a real emergency, many of which may make it difficult to achieve ideal responses in practice.

2.2   The Use of the Term 'Emergency'

Interpretations of the term 'emergency' vary, depending on a person's background and experience. In general, an emergency is a situation which harms (or threatens to harm) people, property or the environment. In these guidelines, the term applies to an incident or circumstance that causes the facility's emergency plan to be activated. Other circumstances, such as a minor spill of hazardous material on site, which is dealt with by standard operating procedures without the need to activate the emergency plan, would not be regarded as an emergency for the purposes of these guidelines.

Therefore, each facility developing an emergency plan will need to define those circumstances that constitute an emergency for its specific operation and activities. This definition should also identify the types of incident or circumstance that do not constitute an emergency and the point at which an emergency ceases to be an emergency.

A facility's definition of an emergency should be distinguished from, and yet complementary to, the use of the term by Police, Fire and other emergency services. The term, as used by the emergency services, will apply not only to events involving hazardous materials in industry but also to a wider range of conceivable incidents. Their sense of the term (and similar expressions such as 'emergency situation') is derived from definitions in relevant legislation and associated policies for determining whether a particular incident or circumstance is to be considered as an emergency.

"Emergency", as defined by the *NSW State Emergency Management and Rescue Act (SERM Act), 1989*, means an emergency due to actual or imminent occurrence (such as fire, flood, storm, earthquake, explosion, epidemic or warlike action) which:

(a)   endangers, or threatens to endanger, the safety or health of persons or animals in the State; or

(b)   destroys or damages, or threatens to destroy or damage, any property in the State,

being an emergency which requires a significant and coordinated response.

For the purposes of the definition of "***Emergency***", property in the State includes any part of the environment of the State. Accordingly, reference to:

(a)   threats or danger to property includes a reference to threats or danger to the environment, and

(b)   the protection of property includes a reference to the protection of the environment.

2.3   The Role of Emergency Planning

Emergency planning aims to prepare for and mitigate the impacts of an emergency. Preparedness requires identifying what to prepare for and how to respond. It therefore involves accumulating knowledge and skills, disseminating information about the management of potential emergencies, and providing and allocating facility resources and personnel to deal with the emergencies identified.

Through emergency planning, facility personnel improve their understanding of the plant, equipment, processes and materials, and their possible impacts in emergency situations. They also develop an understanding of the roles of the emergency services and other external agencies that could be involved in responding to an emergency. This understanding provides a basis for determining the most effective ways of using facility resources, including the development of a management system identifying the

functions required to respond automatically to an emergency. It also provides a basis for informed decision-making during the emergency and for effective working relations with external agencies.

2.4   Relationship with Other Management Systems

Emergency planning should complement any existing management systems, including: safety management; environmental management; risk management; and emergency management. Common elements of these systems include the identification of hazard and risk, training and education, and consultation.

2.4.1   Safety Management

As the title suggests, the safety management system of a hazardous facility is a comprehensive integrated system for managing safety. Under this system, a facility defines its safety objectives and the procedures by which these are to be achieved. It also outlines its safety performance standards and the means of achieving these. The emergency plan is an important element in the safety management system.

2.4.2   Environmental Management

The first step in developing an environmental management system is to identify the potential impacts of a facility on the environment. An organisation must then define its objectives and the policy to be adopted in relation to these environmental impacts. An environmental management plan should be developed defining the processes and procedures to be implemented in order to meet these objectives. As a major component of this environmental management plan, potential environmental emergencies would be identified and procedures determined to respond and minimise the impact on the environment. Where appropriate guidance is available, practices or information provided by the NSW Department of Environment, Climate Change and Water (DECCW) should be followed when addressing environmental issues during the emergency planning process.

2.4.3   Risk Management

Risk management is recognised as integral to effective management. It is an iterative process that involves systematically identifying, analysing, assessing, treating, monitoring and communicating the risks associated with an organisation's activities or processes. In the case of hazardous industries, risk management is undertaken in an attempt to prevent incidents and to minimise their impact if they do occur. Its major link with emergency planning is in the treatment of risks. After all other risk reduction strategies have been adopted into the design and operation of the facility, the emergency plan addresses the risk that still remains.

2.4.4   Emergency Management

The emergency management system is used widely by the emergency services for disaster management planning. This generally covers the planning and co-ordination requirements for large-scale events, such as cyclones, earthquakes, floods, large fires, and also includes large emergencies involving hazardous materials.

Emergency management involves a cyclical process of four phases:

- prevention - regulatory and physical measures to prevent emergencies or mitigate their impact;
- preparedness - arrangements to mobilise and deploy all necessary resources and services;
- response - actions taken during and immediately after an emergency to minimise the impact; and
- recovery - arrangements to restore the facility to normal as quickly and efficiently as possible and to assist the community to recover.

Emergency planning plays a key role in this cycle of emergency management, focussing primarily on the phases of preparedness and response.

2.5　Structure of these Guidelines

These guidelines are intended to trace the steps involved in emergency planning and to highlight the major points to consider in preparing the emergency plan. Section 3 discusses the numerous considerations involved in a thorough approach to emergency planning. The section suggests that planning should be viewed as a cyclical process from the initial stages of defining the aim and objectives of the plan through the ongoing stages of consultation and monitoring and review. Section 4 provides a general layout for an emergency plan including issues distilled out of the emergency planning process. This layout and the accompanying check list in Appendix 4 are designed to assist operators to prepare the plan for their facility. The management of the plan, introduced briefly as part of the planning process in Section 3, is discussed in more detail in Section 5.

Illustrative and other supplementary information is provided in the appendices.

3 Preparing for the Emergency Plan

SECTION SUMMARY

This section outlines the process that should be followed in preparing an emergency plan as well as outlining the NSW emergency management framework.

As with any management system, the emergency plan must have clearly defined aims and objectives and should be developed systematically and consultatively. A number of aspects are discussed in detail, including:

- consultation;

- defining the aims, objectives and parameters of the plan, including the types and levels of emergencies that need to be catered for;

- defining and constructing the system for managing emergencies, including such aspects as developing procedures, identifying necessary resources, and implementation;

- ongoing monitoring and review.

KEY MESSAGE

- An emergency plan is more than a collection of procedures. It must be clearly defined, systematically developed and carefully monitored.

3.1 Introduction

The main consideration of emergency planning is the protection of people, property and the environment from harm during an emergency situation. This is achieved by developing an emergency plan that implements a system able to respond automatically to any emergency and that leads to the most effective outcome possible under the circumstances. The plan should therefore be comprehensive, yet concise, simple and flexible. It should also be dynamic and interactive, ensuring ongoing relevance to the needs of the facility and all stakeholders by continual monitoring, review and consultation. Emergency planning is therefore a cyclical processes illustrated in Figure 2. All of the stages are inter-related and plan details should be continually evaluated, and revised as appropriate.

Figure 2: The Emergency Planning Process
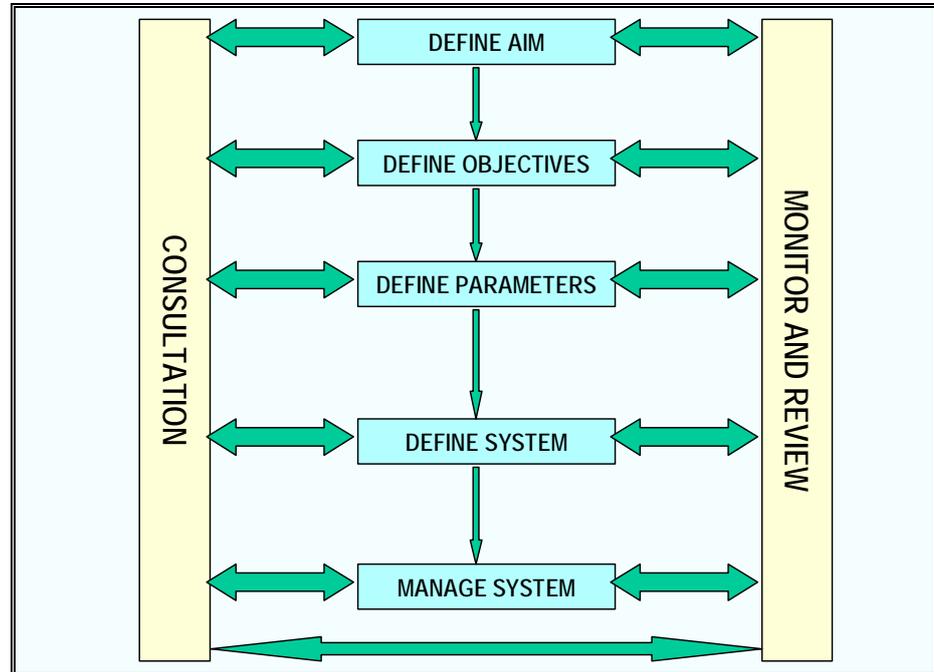
Figure 3 shows in more detail a systematic process for formulating an appropriate Emergency Plan. The process is discussed in more detail in the text that follows.

The key point is that the actual writing of the Emergency Plan needs to be preceded by careful planning, based on an appreciation of the hazards and understanding of the possible emergency scenarios, their possible impacts and the availability of emergency response resources both internal and external to the facility.

This ensures that the aims, objectives and structure of the plan are clear and realistic and that response measures specifically focus on realistic situations.

Figure 3: Emergency Plan Preparation
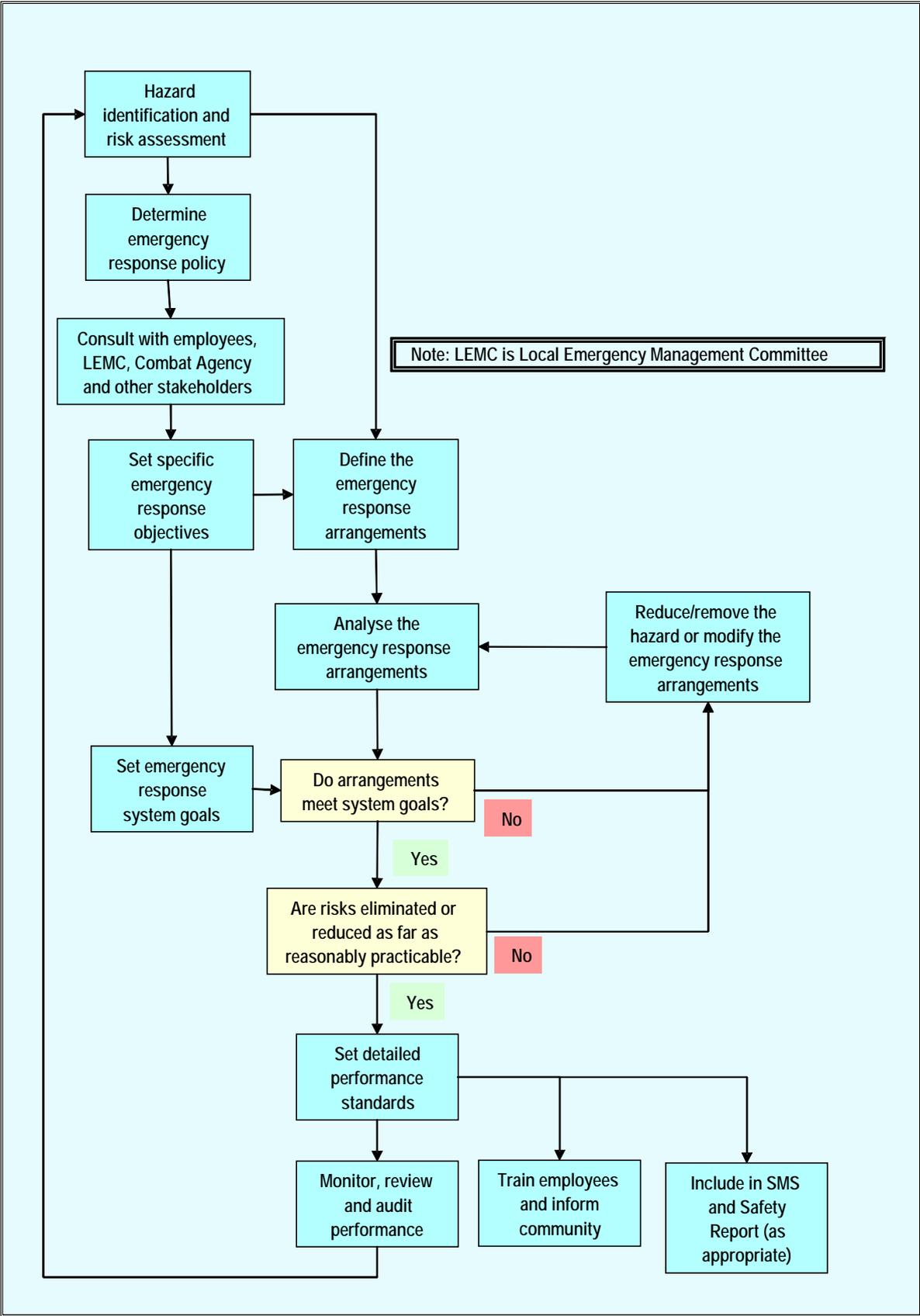
3.2   NSW Emergency Management Arrangements

The community lives in an environment with a variety of both natural and technological hazards and inevitably some of these hazards have a potential for severe social, economic and environmental impact. While most incidents that occur as a result of these hazards can be handled by single agencies using standard procedures, the NSW Government recognises that some events will be beyond the normal capacity of response organisations.

In these rare situations, events that threaten the health and safety of people, property or the environment and which require a significant and coordinated response, may be termed an emergency under the *State Emergency and Rescue Management Act 1989* (SERM Act). Through the SERM Act, the Government has provided a framework for a coordinated response by all agencies having roles and responsibilities during emergencies. [3]

In this context, it is important for the operator of a facility to have an understanding of the emergency management arrangements in NSW and that they actively seek to consider the needs of emergency management committees and combat agencies when preparing for the off-site effects of a major accident.

> **Note 1: Caution on the term 'emergency'**
> 'Emergency' in this context, does not necessarily relate to the use of the term as adopted by a particular industrial facility. Most incidents that require the activation of a facility Emergency Plan will be handled by the facility personnel and local emergency services using standard procedures. Only rarely will an event be beyond local resources and require a significant and coordinated response.

The SERM Act provides for:

* the establishment of Emergency Management Committees at State, District and Local levels to produce plans that prepare for the response to and recovery from emergencies that occur; and

* the preparation of State, District and Local Disaster Plans (DISPLANs), sub-plans and supporting plans to ensure a coordinated response to any emergency.

3.2.1   The State Disaster Plan (DISPLAN)

The key element of emergency management planning in NSW is the State Disaster Plan (DISPLAN). The objective of DISPLAN is to ensure the co-ordinated response by all agencies having responsibilities and functions in emergencies. The DISPLAN—

* identifies combat agencies primarily responsible for responding to emergencies;

* specifies the tasks to be performed by all agencies in the event of an emergency;

* provides for the co-ordination of activities of other agencies in support of the combat agencies; and

* specifies the responsibilities of the Minister and the State, District and Local Emergency Operations Controllers

An important principle of Emergency Planning in NSW is that local communities have the greatest awareness of the needs and resources of their community. Accordingly DISPLAN devolves control and co-ordination of emergency operations and responsibility for preparedness, response, and recovery to the lowest possible level, but provides a structure to support local communities with resources from District and State level if needed.

---

[3]   Note, that while this information was current at the time of publication, the NSW Government's emergency management web site (www.emergency.nsw.gov.au) should be consulted for current arrangements.

3.2.2 Emergency Planning Committees

Emergency Management committees are established at State, District, and Local levels and membership includes representatives from emergency services, other combat agencies and participating and supporting organisations.

Local Government Councils provide the chairperson for the local emergency management committee (LEMC) and the NSW Police provide the chairperson for the District and State Emergency Management Committees (DEMC and SEMC respectively).

In preparing an Emergency Plan, the facility should liaise closely with both the LEMC and DEMC and with representatives of appropriate Combat Agencies. Liaison with the Local and District Emergency Management Committee is especially important when local emergency plans for incidents having off-site effects are being developed by these Committees.

Within NSW, the LEMC is responsible for planning for emergencies that might occur within their local area; however the DEMC is responsible for planning for emergencies involving hazardous materials.

3.2.3 The Role of the Combat Agency

A Combat Agency is the agency with the specific expertise and equipment to deal with the effects of designated hazards. The agencies responsible for each hazard are designated in DISPLAN. For land based incidents, involving hazardous materials, Fire and Rescue NSW is the nominated Combat Agency.

Where a Combat Agency is designated in DISPLAN the head of the Combat Agency controls the Combat Area and the NSW Police have overall control of the site. Where no Combat Agency is designated, control of the operation is vested in the Emergency Operations Controller.

The Commissioner of Police appoints a Police Officer to be the Local Emergency Operations Controller (LEOCON) at the Local Government level and the District Emergency Operations Controller (DEOCON) at district level.

3.3 Consultation

Consultation is the key to an effective emergency plan and should be conducted in all phases of the planning process. All stakeholders affected by the plan (including facility personnel, the community, and external agencies) should be consulted to ensure that each group knows what to expect of the other.

A coordinated and effective response to any emergency requires an understanding between the different parties involved. Consultation when developing the emergency plan enables the development of this understanding before an incident occurs. It ensures that the roles, responsibilities, functions and needs of all agencies and groups are understood and accurately incorporated into the emergency plan. Once the plan is implemented, consultation during the management of the plan allows all stakeholders to contribute to the testing, monitoring and review, and updating of the plan.

To ensure that consultation is comprehensive, the key stakeholders in the emergency planning process should be identified and on-going relationships with these groups developed. One method of achieving this is by forming an emergency planning working group that includes representatives from all interested parties. While much of the work in developing and managing the emergency plan can be performed by facility personnel, this working group can assist in developing concepts and ideas, and also in verifying that the emergency plan adequately addresses their particular concerns.

The stakeholders and issues identified below are not exhaustive; a specific facility may need to consider other groups or issues.

3.3.1   Facility Personnel

All employees (including employee representatives) should be consulted extensively during the emergency planning process. Not only does this ensure that their intimate knowledge of the facility and its operations is incorporated into the development of the emergency plan; it also generates a sense of commitment and ownership. Each person within the organisation has a responsibility to ensure that they are capable at all times of fulfilling their role in the event of an emergency.

Ongoing consultation with facility personnel should be actively pursued. For example, staff should be involved in preparing and conducting exercises in order to test the capability of the plan. Debriefings following these exercises can allow participants to indicate the problems encountered and suggest possible solutions.

3.3.2   Neighbouring Facilities and the Community

Consultation with neighbouring facilities and the community should result in a two-way flow of issues and ideas. Community consultation not only results in a better prepared community; it can often lead to an improved understanding and acceptance of the industry by the wider community.

It is first necessary to identify all neighbours, including those that may have special requirements, such as:

- neighbouring hazardous facilities;
- local mutual aid groups;
- managers of sensitive environmental sites;
- facilities accommodating large numbers of people (e.g. commercial or shopping centres, motels, recreational facilities); and
- facilities provided for members of the community who may be more vulnerable to the consequences of an emergency (e.g. schools, child care centres, hospitals, and nursing homes).

With respect to neighbouring hazardous facilities, it is essential that all parties gain an understanding of the potential impacts of an incident on other operations or storage areas. This will enable procedures to be developed to prevent the escalation of an incident. Neighbouring facilities may also be able to provide resources, including personnel, for responding to an emergency. Several industries of related types of operation or locality may be involved in this type of cooperative arrangement, often referred to as a mutual-aid group.

There needs to be an effective warning system for the neighbouring community who could be affected by the emergency. Members of the community need to be aware of the action to be taken when the warning is activated. Therefore, the operator must ensure that information on safety measures and the appropriate response in the case of an emergency is provided to the community, without their having to request it. Consultation should identify the needs of the community and address the difficulties likely to be encountered.

3.3.3   External Agencies and Other Groups

Police, Fire and other emergency services, Local Government, and safety, health and environmental agencies (government and non-government) should be consulted throughout the emergency planning process. This may be most appropriately done through the LEMC.

The degree of involvement of Government and other agencies in an emergency will depend on the level and potential consequences of the emergency. Consultation can help to define the circumstances when external agencies or other groups need to become involved. This consultation should also result in a clear understanding by all parties of the roles and responsibilities of each group at an emergency. In order to formalise this understanding, the facility operator may need to establish partnership

agreements with the relevant agencies. These agreements should outline the interactions between the organisations, including details of the assistance to be provided in each instance.

In many cases, a number of hazardous industries may be located together within an industrial estate or region, for which a coordinated emergency plan may be developed. The emergency plan for each individual facility should provide a basis for, and be consistent with, such a coordinated emergency plan.

In addition, Local Government chairs the LEMC, which is responsible for identifying hazards and threats in its area and developing and implementing plans to address these hazards. This is usually achieved by an inter-agency committee. The facility operator should liaise closely with this committee so that measures developed to respond to a major emergency at the facility are incorporated into the Local Government's regional plan and are complementary with arrangements made for other types of hazards.

Operators of Major Hazard Facilities should establish with the Local and District Emergency Management Committees what information they require for inclusion in the local emergency management off-site plan.

3.4   Defining the Aim of the Plan

The aim of an emergency plan should be expressed as a broad statement of planning intent. It should be based on the fundamental reasons for developing a plan. Examples of aims are:

- to provide a system and resources to deal with emergencies to protect people, property and the environment; and

- to minimise adverse impacts on people, property and the environment.

3.5   Defining the Objectives of the Plan

The objectives of the plan translate the broad aim into specific end results to be achieved. They lay the groundwork for defining and implementing the facility's system to manage an emergency. Therefore, the areas addressed by the objectives should be as comprehensive as possible. The establishment of priorities will also help to focus efforts in defining and implementing a system to meet the needs of all stakeholders.

Examples of objectives include:

- to maintain a high level of preparedness;

- to respond quickly and efficiently to limit the impacts of an emergency;

- to manage an emergency until the emergency services arrive and take control;

- to support emergency services with information, knowledge, skills and equipment; and

- to protect emergency responders, personnel and the community from harm.

3.6   Defining the Parameters of the Plan

In preparing an emergency plan, it is necessary to define the parameters that will characterise the framework for developing the plan. These parameters should define the scope of the emergency plan and identify any limitations. Some of the parameters that should be considered are addressed in this section. However, there may be others, not covered here, that are specific to a particular facility.

One of the fundamental parameters is identifying the potential for emergencies and their characteristics. First, a definition of an emergency situation is necessary because an emergency plan is only activated in an emergency situation and de-activated when the emergency situation ceases to exist. The identification of the hazards will help to define the other parameters of the plan, as will estimation (for a range of scales of

incidents) of the consequences and potential impacts of these hazards on people, property and the environment. In addition, any assumptions that might influence the system to be developed to manage an emergency should be identified and evaluated.

3.6.1 Emergency Situations

A clear simple definition of what constitutes an emergency at the facility (i.e. a situation, which activates and de-activates the emergency plan) is required. For example, an emergency for a facility and its operations may be described as:

> *a hazardous situation (or threat of a hazardous situation) which requires action to control, correct and return the site to a safe condition and also requires timely action to protect people, property and the environment from harm.*

The level at which a hazardous situation should be regarded as an emergency needs to be defined. However, if there is any doubt whether a hazardous situation constitutes an emergency, it should be treated as an emergency. For example, all fires should be treated as emergencies. (Section 2.2 and Section 3.6.2 may also assist a facility to define an emergency for its planning purposes.)

3.6.1.1   Types of Emergency

Emergencies are defined according to type on the basis of the materials and activities involved. The type of emergency will determine the potential impact of the incident on people, property and the environment. These issues should be addressed in the process of defining the hazards. (See Section 3.6.2) Examples of types of emergencies are:

- fire (including the generation of toxic combustion products);
- explosion (including BLEVE);
- spill (of hazardous solids and liquids);
- gas leak (flammable, toxic, asphyxiant, pressurised or refrigerated liquid);
- structural failure;
- natural event (including flood, earthquake, storms, storm tides, etc.);
- impact event (road vehicles, railways, aircraft, ships);
- subversive activities (bomb threat, vandalism, sabotage); and
- transport incident.

These types of emergencies should be considered for:

- an incident within the facility;
- an incident occurring outside the facility where a hazardous material is under the responsibility of the facility (e.g. off-site pipeline, transport); and
- secondary events or knock-on effects arising within or outside the facility (e.g. a flood, a bushfire, or an explosion, which causes a nearby vessel to fail).

3.6.1.2   Levels of Emergency

Emergencies can vary in scale. For this reason, it is suggested that different levels of emergency be defined for the facility. Information provided by the hazard analysis (see Section 3.6.2.2) will provide guidance in determining the level of emergency for a particular type of incident.

Table 1 provides guidance for facilities when defining levels of emergency. The three levels described are illustrative and advisory only, and should not limit the way in which a facility chooses to define its own levels of emergency. For example, smaller industries may only require one level of emergency, while medium to larger scale facilities could use one, two, or more levels of emergency.

There is not necessarily a direct correlation between the size of a release and the scale of the emergency. For example, a small release of chlorine gas may affect people

outside the boundary of the facility and therefore be classed as an 'external' emergency (using the definitions in Table 1). In comparison, a large release of an alkali that is contained within a bunded area could be classed as a 'local' emergency.

Table 1: Examples of Levels of Emergency

LOCAL	SITE	EXTERNAL
An emergency where the impacts on people, property and the environment: • are expected to be confined to a specific location within the facility and no escalation is expected	An emergency where the impacts on people, property and the environment: • are expected to spread to or affect all parts of the facility, but not off-site	An emergency where the impacts on people, property and the environment: • are expected to impact both within the facility and beyond the boundary of the facility
Emergency Services **MAY BE REQUIRED**	Emergency Services **SHOULD BE REQUIRED**	Emergency Services **WILL BE REQUIRED**
Examples: • ruptured drum in warehouse • leaking flange or seal • small fire in a bag store	Examples: • tank or bund fire • pipe rupture	Examples: • a bomb threat • large tank bund fire • BLEVE of large liquefied gas storage • toxic gas release • transport incident

3.6.2   Defining the Hazards

Information on the potential hazards at a facility will help to provide an understanding of the impacts on people, property and the environment of different types and levels of emergencies.

3.6.2.1   Hazard Identification

The emergency planning process should identify all hazards, which can reasonably be expected to initiate, or contribute to, an emergency. This could involve identifying hazards of several different types:

- the hazards arising from the hazardous materials associated with the facility;
- the hazards arising from activities or equipment associated with the facility (e.g. cranes, plant, machinery, transport, electrical); and
- natural hazards (e.g. floods, lightning strike, etc.) that could impact upon the safe operation of the facility.

If a risk assessment or other safety study (such as HAZOP) has been conducted, a list of potential incidents may already be available.

It is not feasible, or appropriate, to develop individual systems to respond to every potential incident identified in the hazard identification exercise. The challenge is to prepare a simple and effective plan that is generic in nature, but provides an effective system for responding to any type or level of emergency. Therefore, a screening technique should be adopted to produce a representative set of incidents.

One method of achieving this is to take the following steps:

- eliminate localised incidents that would not require activation of the emergency plan;

- consolidate incidents that have similar materials, inventories, discharge rates, discharge locations, and types of emergency response actions, but being mindful of impacts, the potential for escalation and the manner in which a release or failure scenario could escalate; and

- select one incident to represent each group identified.

In preparing this representative set of incidents, it should be remembered that emergency planning prepares for events that it is hoped will never happen. Therefore, detailed planning should not only concentrate on the more likely or credible events (such as a small leak from a pipe or failure of a single 200 litre drum), but also extreme events (such as the catastrophic failure of a reaction or storage vessel). These events would have a high impact even though the likelihood of their occurrence is extremely remote. This consideration of a broad range of possibilities will enable the development of a system capable of responding to any level and type of emergency.

3.6.2.2 Hazard Analysis

The hazard identification exercise may reveal a whole spectrum of incidents, which can significantly impact on people, property and the environment (including fire, explosion, and dispersion of toxic chemicals, violent reaction, polymerisation or decomposition).

In order to define the system to manage an emergency, an understanding of the actual impact of an incident is essential. From information available on the operating conditions, the facility layout, nature of surroundings and environmental conditions (such as the range of weather conditions possible at the site, and the flow characteristics of nearby waterways), the following can be estimated:

- the rate at which a material is released;

- the dispersion of toxic or flammable vapours in the atmosphere;

- the radiated heat generated by a fire;

- the blast generated by an explosion;

- the concentration of a toxic material in the atmosphere; and

- the dispersion of contaminants in nearby waterways (including sub-surface aquifers).

An understanding of the physical and chemical properties of these events enables the potential impacts to be determined. There are many modelling tools available for calculating this information, both qualitative and quantitative, and ranging from simple hand calculation techniques to sophisticated computer models. Further information on assessing the consequences and impacts of incidents is provided in *Hazardous Industry Advisory Paper No. 6 – Guidelines for Hazard Analysis* (HIPAP 6).

Some potential impacts of an incident on the environment may not be immediately apparent. Frequent minor incidents may cause long-term degradation of the environment.

3.6.3   Physical Areas to be Covered by the Emergency Plan

The geographic area over which a large scale emergency might impact should be defined. This area can be estimated in the process of defining the hazards (see Section 3.6.2). Features considered should include:

- the exposure of people;

- the exposure of sensitive environmental receptors;

- all equipment and operations located within the boundaries of the facility;

- hazardous materials being transported or removed from the site that are under the responsibility of the facility;

- any other areas or activities under the control or influence of the facility that are not on-site and not covered by a separate emergency plan (e.g. off-site pipelines supplying raw materials to the facility and product from the facility); and

- the area beyond the boundary of the facility which is likely to be affected in the event of an emergency. (This area, often referred to as the community information area, will be determined by a hazard analysis - see Section 3.6.2.2)

Significant community and environmental features surrounding the facility need to be identified. These should include centres where large numbers of people gather (e.g. sporting complexes, function centres), sensitive land uses (e.g. schools, hospitals, child care facilities, nursing homes), and sensitive environmental receptors. Sensitive environmental receptors may include:

- surface waterways (e.g. creeks, rivers, stormwater drainage systems, access to sewerage system);

- sub-surface aquifers;

- soil (considering characteristics such as soil permeability which controls the rate at which leachate from contaminated land will reach ground water reservoirs); and

- natural buffers, wildlife corridors, State forests / national parks.

3.6.4   People to be Covered by the Emergency Plan

The people likely to be affected by an emergency will be located in the physical area to be covered by the plan, as identified in Section 3.6.3 above. The total number of people possibly affected should be estimated. The significance of their exposures can be estimated in the hazard definition process (see Section 3.6.2). Groups of people to be identified may include:

- facility personnel (on-site and off-site);

- visitors on-site;

- contractors on-site;

- emergency responders;

- people occupying sensitive land use sites, who may be more vulnerable to the consequences of an emergency; and

- people within the community information area (including commercial, industrial, and residential neighbours).

Large groups of people, or those more vulnerable to the consequences of emergencies, need to be given special consideration when determining procedures for protecting people from the impacts of an incident.

3.6.5   Assumptions Affecting the Emergency Plan

The emergency plan will usually be based upon assumptions about matters such as the availability of resources and services and the execution of responses within estimated time frames. These assumptions should be evaluated and contingency planning developed to accommodate an emergency where these assumptions fail. Examples include:

- increased response times of the emergency organisation and emergency services;

- unavailability of staff;

- failure of services and/or utilities (gas, electricity, water, telecommunications, and emergency services such as fire-fighting water and emergency generators);

- overlap between the facility emergency control centre and an inappropriate hazard zone (see Section 4.11.1);

- adverse weather conditions; and

- inaccessible or inoperable emergency equipment, isolation equipment and/or safety critical equipment.

3.7   Defining the System

The next stage is to define a system to manage an emergency, which is flexible, simple to implement, and general in application. It should be tailored to meet the needs of the facility, within constraints such as the resources available. The phases involved are design, construction, and commissioning.

3.7.1   Designing and Constructing the System

The design process needs to satisfy the aims and objectives of the emergency plan. The construction process provides the resources to support the design, including the response resources; personnel to carry out emergency functions; information, skills, and knowledge to enable these personnel to manage an emergency; and written emergency procedures.

The system should reflect expectations relating to the facility's role in the management of an emergency. The system should be able to spontaneously respond when the alarm is raised as early detection and intervention are vital to ensuring that a small incident does not escalate to become a major disaster. The system should also be able to operate within a specified short time frame, i.e. the critical initial period before the emergency services assume control. Thereafter, the system should support and liaise with the emergency services and other external agencies. The system should also be able to manage smaller emergencies or environmental emergencies, which the emergency services, might not be required to attend.

The capabilities of the system should be based on the parameters of the emergency plan, such as:

- the potential nature and size of an emergency, derived from the hazard analysis;

- the hazardous materials of greatest concern with respect to their impact on people, property and the environment in emergency situations; and

- the potential for further problems arising from the properties of the hazardous materials, e.g. ignition sources for flammable gases and vapours.

The system should also take into account the limits of the facility's physical response capabilities. Obviously, the scale of the system developed will depend on the hazards associated with the facility, and its resources. An over-commitment or under-dedication of resources will result in an ineffective system.

The system will share similarities with other systems of management. It should include an organisational structure with a chain of command and specified emergency functions to be carried out by facility personnel. The system should have established and approved procedures and resources designated for the purpose, and personnel should be provided with the necessary information, knowledge and skills to carry out the responsibilities assigned.

3.7.2   Emergency Functions

The system should include defined emergency functions which, like emergency planning in general, aim to protect people, property and the environment. The functions nominated should cover all areas of responsibility necessary to manage the types of emergencies identified. These functions should be defined, taking into account the facility's response requirements and capabilities (i.e. the nature of the operation, the types of emergencies identified, and the number of personnel available). Broad areas to be addressed by emergency functions should include:

- responding to control the emergency;

- limiting the spread and impacts of an emergency on adjoining processes, materials, property, and the environment;

- protecting the safety and health of all personnel on site;

- protecting the environment;

- alerting people to the emergency and communicating adequately with all stakeholders during the emergency;

- accessing the right information; and

- controlling the entire emergency scene and the whole facility.

These areas may be addressed by several functions. For example, the protection of the safety and health of all personnel on site may be addressed by functions relating to search and rescue, roll-call, and safeguarding measures such as evacuation. (See Section 4.9 and Appendix 3 for a further explanation of emergency functions and organisation).

Positions should be established, and personnel assigned to these positions, to fulfil the functions identified. The expectations, information and resources associated with each function should be established, as well as the inputs that can be expected from other facility personnel, the Police, Fire Service and the other emergency services. Overall responsibility for these functions is to be assumed by the facility emergency controller who is supported by the personnel allocated to carry out the various functions.

3.7.3   Emergency Procedures

Emergency procedures are a series of steps that need to be followed when responding to an emergency. When defining these procedures, it is important to recognise the limitations of personnel in performing tasks, particularly while under extreme stress.

Emergency procedures are generally of two types: those that relate to the system of management (i.e. general procedures to be adopted regardless of the nature, type and scale or emergency) or those specific to the types of incidents identified.

Areas relating to the system that might be addressed by emergency procedures include:

- raising the alarm;

- activating the emergency plan;

- activating the emergency services;

- terminating the emergency; and

- health and safety functions, such as roll call and search and rescue.

Procedures should be developed for all positions within the emergency organisational structure, in particular outlining the roles, responsibilities, and duties involved. Procedures should also be developed for other facility personnel not involved in the emergency organisational structure.

3.7.4   Facility Emergency Resources

The emergency resources necessary to manage an emergency situation should be identified and provided. Such resources include the facility emergency control centre, the emergency communications system, public warning systems, the emergency alarm system, and emergency equipment (such as personal protective clothing and first aid equipment).

The design and provision of emergency resources should consider such matters as:

- their safe and accessible location;

- their ability to be moved to areas as intended (e.g. neutralising agents);

- their suitability for all tasks for which they are provided;

- their readiness for use and their ease of use;

- the adequacy of estimations of quantities; and

- the provision of adequate quantities.

The hazard analysis can help to identify the safety equipment required to respond to the incident and appropriate locations for this equipment to be stored, by identifying 'clean' areas, that is, areas outside potential hazard zones. The functioning capabilities of resources should be considered for all places (e.g. the alarm's ability to reach the people to be alerted), all times (e.g. at night and out of hours) and all circumstances (e.g. adverse weather conditions).

(Further information on facility emergency resources can be found in Section 4.11.)

3.7.5 Information, Knowledge and Skills

3.7.5.1 Provision of Information

The system should provide access to user-friendly information to assist in managing the emergency. This information should include:

- safety, health and environmental information on hazardous materials, their location and type of containment;

- estimates of the consequences and impacts from hazard analysis;

- maps and plans;

- community information;

- information on safety systems and equipment; and

- emergency contacts.

(Refer to Section 4.16 for further details).

The system should provide for the communication of information about the plan to stakeholders, including people within the community information area and contractors and other on-site visitors.

3.7.5.2 Developing Knowledge and Skills

The system should identify and develop the appropriate levels of knowledge and skills to be acquired by facility personnel assuming specified responsibilities. Training and education should be provided to enable personnel to achieve these levels.

In addition, all personnel, whether or not they hold a position in the emergency organisational structure, should be trained in their roles, responsibilities and duties during an emergency (e.g. all personnel should be trained in evacuation procedures). They should be trained to such a level that, when the emergency plan is activated, they can automatically follow their procedures without necessarily referring to the emergency plan and can competently operate the emergency resources. Supporting information, provided outside the emergency plan, such as palm cards or signs may assist them. Training will achieve a greater significance if all personnel have a sense of ownership of the emergency plan.

It is important that key people at the facility understand the potential impacts of the hazardous materials associated with the facility. This understanding will provide the basis for informed decisions to be made in the early stages of an emergency and for advice to be provided to the emergency services.

This understanding can also be used to set priorities in responding to an incident. For example, when considering actions to control or mitigate the impacts of an incident, it may be considered appropriate to allow the incident to proceed with minimal or no direct response. Such a mode of response may result in a lower overall impact (when considering people, property and the environment) than if significant effort were expended in protecting property to the detriment of the surrounding community and the environment. This knowledge of hazardous materials and their impacts may also indicate where to concentrate response efforts, for example, by deciding when it may be more appropriate to focus on protecting adjacent operations rather than expending efforts and resources on an incident that cannot be controlled or that poses an

unacceptable threat to the safety of the emergency responders. A typical example of this situation relates to managing an emergency involving an LPG tank on fire. In such an emergency, efforts are usually directed at isolating the fuel source and cooling adjacent equipment rather than putting out the fire.

3.7.6 Commissioning the System

The commissioning of the system is the process of ensuring that the system functions effectively, according to the intentions of design and construction. Effective commissioning of the system depends on a commitment to providing sufficient time and resources to ensure that the system is workable, simple and flexible, and meets its aims and objectives.

During commissioning, the system should be evaluated to detect problems (such as lack of direction, oversimplifications, poor understanding of the issues, inappropriate assumptions, etc.) which may affect the effectiveness of the emergency plan, and to identify methods for improving the efficiency of the plan. A practical exercise, or mock incident, involving external agencies is an effective way of testing all, or part of, the emergency plan.

Commissioning of the system might include ensuring that:

- all procedures are validated as safe and personnel are not exposed to an unacceptable risk while undertaking defined tasks and other activities;

- emergency resources and safety equipment are rated for the task;

- emergency resources and safety equipment are clearly identified, accessible, available, serviceable and ready for use;

- communications methods and equipment are satisfactory;

- response times for the facility and the emergency services are tested, known, and found to be realistic;

- suitable supporting information is provided and accessible;

- emergency service vehicles have access to the appropriate parts of the facility;

- the facility emergency controller, emergency organisation personnel and facility emergency responders are suitably identified;

- the plan satisfies the expectations of stakeholders;

- the plan can be updated easily and the information communicated as appropriate; and

- the information of the quantities, locations, properties of hazardous materials is accessible and the potential impacts of these materials are known and understood by key personnel.

- there is a clear understanding of the roles of the different agencies forming the local emergency services, especially Fire and Rescue NSW. These roles would have been developed and agreed to in consultation with the Local Emergency Management Committee and other relevant emergency services.

Once this process has been completed, the system should be managed as described in Section 5.

3.8 Monitor and Review

The facility should establish and maintain policies and procedures to monitor and review the suitability and effectiveness of all phases of the planning process at specified intervals or after circumstances defined by the facility operator. This ensures that the plan remains relevant to the facility and that it is updated to reflect changes in plant operation and personnel.

Monitoring, which is covered further in Section 5.9, is critical to managing the plan. Important activities in managing the plan include rehearsals, exercises and on-going consultation and communication with facility personnel, the emergency services and the community. These activities can help to identify deficiencies in the emergency plan, which can then be remedied.

4 Writing the Emergency Plan

SECTION SUMMARY

This section suggests a general format for an emergency plan and matters that should be considered when writing it. While simple facilities may have abbreviated plans, there are a number of features that need to be present in all emergency plan documentation:

- formal document control procedures;

- clear aims and objectives;

- identification of hazards and the types and levels of emergencies covered by the plan;

- details of emergency roles and responsibilities;

- communication arrangements, including internal and external notification of activation of the plan and termination of an emergency;

- procedures for specific emergencies; and

- supporting information, such as emergency telephone numbers, site layout and location drawings/maps, and information about emergency equipment and other resources.

KEY MESSAGE

- To be effective, the emergency plan should be clearly documented in a way that is readily accessible to all stakeholders.

4.1 Introduction

A summary of the outputs of the emergency planning process should be documented in the facility's emergency plan. The plan should define areas such as the facility's emergency functions and organisational structure, emergency procedures, equipment, reporting and communication channels, and the type of reporting required by the Police, Fire Service, etc.

This section outlines a general format for an emergency plan and matters that should be considered when writing it. Since the plan is to be tailored to suit the facility, the format may vary. Suggested sections in the plan are outlined below. Points raised for consideration are not exhaustive.

Smaller facilities for which an emergency would have minimal impact beyond their boundaries would require a less detailed plan than more complex facilities.

4.2 Plan Title and Authority

The plan should clearly identify:

- the name of the facility and the operator;

- the identity, scope, and status of the emergency plan;

- the location of the facility;

- preparation details (the date of preparation and other terms of reference);

- authorisation details (person(s) responsible);

- contact details; and

- document control information.

4.3 Table of Contents

A table of contents should be included for quick reference to selected topics.

4.4 Introduction and Definition of an Emergency

The introductory section of the plan should contain a definition of the situation that constitutes an emergency for the facility (see Section 3.6.1) and an outline of the levels of emergencies identified. Other assumptions underpinning the plan should also be stated (see Section 3.6.5).

4.5 Aim and Objectives of the Plan

A statement of the aim and a list of the objectives of the plan should be included. (See Sections 3.4 and 3.5.)

4.6 Roles of Agencies, Groups, Industry and the Community

The roles, responsibilities, functions and needs of all key stakeholders (industry, the community, and external agencies such as the Police and Fire Service) should be clearly defined. These definitions will be derived through extensive consultation. The plan should identify the phases when consultation is necessary, such as when the plan is being updated.

4.7 Hazards

Details should be provided of the hazards identified as having a significant impact. (See Section 3.6.2.) This should apply to hazardous materials and other hazards.

4.7.1 Details of Hazardous Materials

Details of all hazardous materials in significant quantities under the control of the facility, including hazardous intermediates, should be provided in the plan. This will include materials in quantities sufficient to initiate an emergency or to contribute to an initial incident. The relevant quantities will depend upon the form and properties of these materials. The significance of the problem posed by these materials should be discussed and the way in which the plan addresses any problems identified.

Hazardous materials include:

- dangerous goods;
- goods too dangerous to be transported; and
- other hazardous materials (such as poisons, workplace hazardous substances, combustible liquids, carcinogens, environmentally hazardous materials, etc.).

Details of hazardous materials should include the following:

- description of the hazardous material (including the name of the chemical ingredients for materials listed under trade names);
- classification (UN No, CAS No, dangerous goods classification and HAZCHEM Code where applicable);
- quantity (including average and maximum inventory in storage and/or in the process, accounting for seasonal factors);
- location of tanks or package stores, (keyed to the site layout plan - refer to Section 4.16.4); and
- location of additional safety, health and environmental information as described in Section 4.16.2.
- description of safety critical equipment, especially equipment used for the isolation and/or containment of a release.

4.7.2 Details of Other Hazards

Information should be provided on the nature of other hazards identified for inclusion in the plan (i.e. natural hazards or hazards arising from activities not involving hazardous materials). A brief explanation of how the plan will address these hazards should be presented.

4.8 Types and Levels of Emergency

The types and levels of possible emergencies identified for the facility should be described. (Refer to Section 3.6.1.1 and Section 3.6.1.2 respectively.)

4.9 Emergency Functions and Organisational Structure

The emergency organisational structure will embody all emergency functions identified, i.e. the allocated areas of responsibility involved in managing an emergency at the facility. The functions nominated for the facility should be listed in the plan, together with the associated roles, responsibilities and duties of personnel assigned to these functions, and arrangements for appropriate backup.

The functions should address the areas of responsibility required to manage the emergency as outlined in Section 3.7.2. The specific manner of translating areas of responsibilities into functions will depend on the size and the resources of a facility.

4.9.1 Facility Emergency Control

The person fulfilling the function of facility emergency control, and designated as the facility emergency controller, is in charge of managing an emergency for the facility and has overall responsibility for all functions performed by facility personnel during an emergency. This role requires a sound knowledge of:

- the site;
- the materials used;
- the processes;
- the potential impacts of emergencies on people, property and the environment;
- waste control and;
- the application of the emergency plan.

While some of these duties may be assigned or delegated to other positions or personnel in the emergency organisational structure before or during the emergency, ultimate responsibility remains with the facility emergency controller. The plan should define the role, responsibilities and duties associated with the position, including arrangements for delegation.

4.9.2 Identification

The people acting in a position within the organisational structure, or conducting certain emergency functions, will require clear methods of identification. For example, helmet colours (as outlined in Australian Standard AS 3745 - *Emergency control organization and procedures for buildings, structures and workplace*s) and distinctive tabards identifying the facility and the emergency position or function, may be used.

4.10 Emergency Procedures

Emergency procedures are an important part of the system to manage an emergency. (See also Section 3.7.3) They should be clear, simple, practical and achievable. The detail contained in the procedure will depend upon the characteristics of the facility. The procedures should describe the steps to be undertaken, the precautions, the

protective clothing and equipment to be used, any special conditions, and the responsibilities and duties of people undertaking these procedures.

The emergency response flowchart in Figure 4 describes some of the decision-making steps, and their interactions, in the overall management of an emergency. Flowcharts of this type can be used to assist in the development of procedures for the management of emergencies.

Emergency procedures relating to incidents should take into account the properties of the hazardous materials and the impacts on people, property and the environment, as estimated in the hazard analysis process (see Section 3.6.2). As an example, the following actions might be considered in developing the steps for an emergency procedure relating to a spill of corrosive liquid:

- raise the alarm;

- isolate the source of release;

- contain the spill;

- isolate/evacuate the immediate area;

- use of appropriate protective equipment;

- use of absorbents; and

- waste control and disposal.

4.11 Emergency Resources

The resources (equipment and amenities) provided to respond to emergencies should be identified and details provided. (See Section 3.7.4)

4.11.1 Facility Emergency Control Centre

The location of the facility emergency control centre (FECC) and any alternative should be nominated. The FECC should be readily accessible and should be appropriately resourced with communications equipment and essential documents, including the emergency plan, emergency procedures, MSDS and other relevant safety information. Location maps, site layout plans (see Section 4.16) as well as information relating to the relevant hazards and emergency equipment available, should be available in the FECC and should be distributed to the emergency services. A dedicated FECC may not be necessary for smaller facilities that could use existing office amenities.

Ideally, the FECC should be located outside a potential hazard zone. If the hazard zone envelops the centre during an emergency, control operations should proceed to an alternative control centre identified in the plan.

4.11.2 Emergency Equipment

The availability and location of specialised emergency equipment to support the functions identified in the plan should be indicated on the site layout plan. Details of, and procedures for, access to additional equipment from other sources such as mutual aid facilities, should be provided. Emergency equipment may consist of the following:

- emergency vehicle(s);

- self-contained breathing apparatus;

- fire fighting equipment;

- containment equipment such as booms, sandbags, vermiculite or sand;

- fire-fighting media (i.e. foams, additional water supplies, etc.);

- neutralising agents;

- personnel identification (e.g. helmets and tabards);

- protective clothing (e.g. overalls, chemical splash suits, gloves etc.);

- specialist equipment (e.g. weather and environmental monitoring equipment, gas detectors, emergency power and lighting, etc.);

- first-aid equipment; and

- location of service isolation equipment for the isolation of electricity, gas and steam.

Figure 4: Emergency Response Flowchart
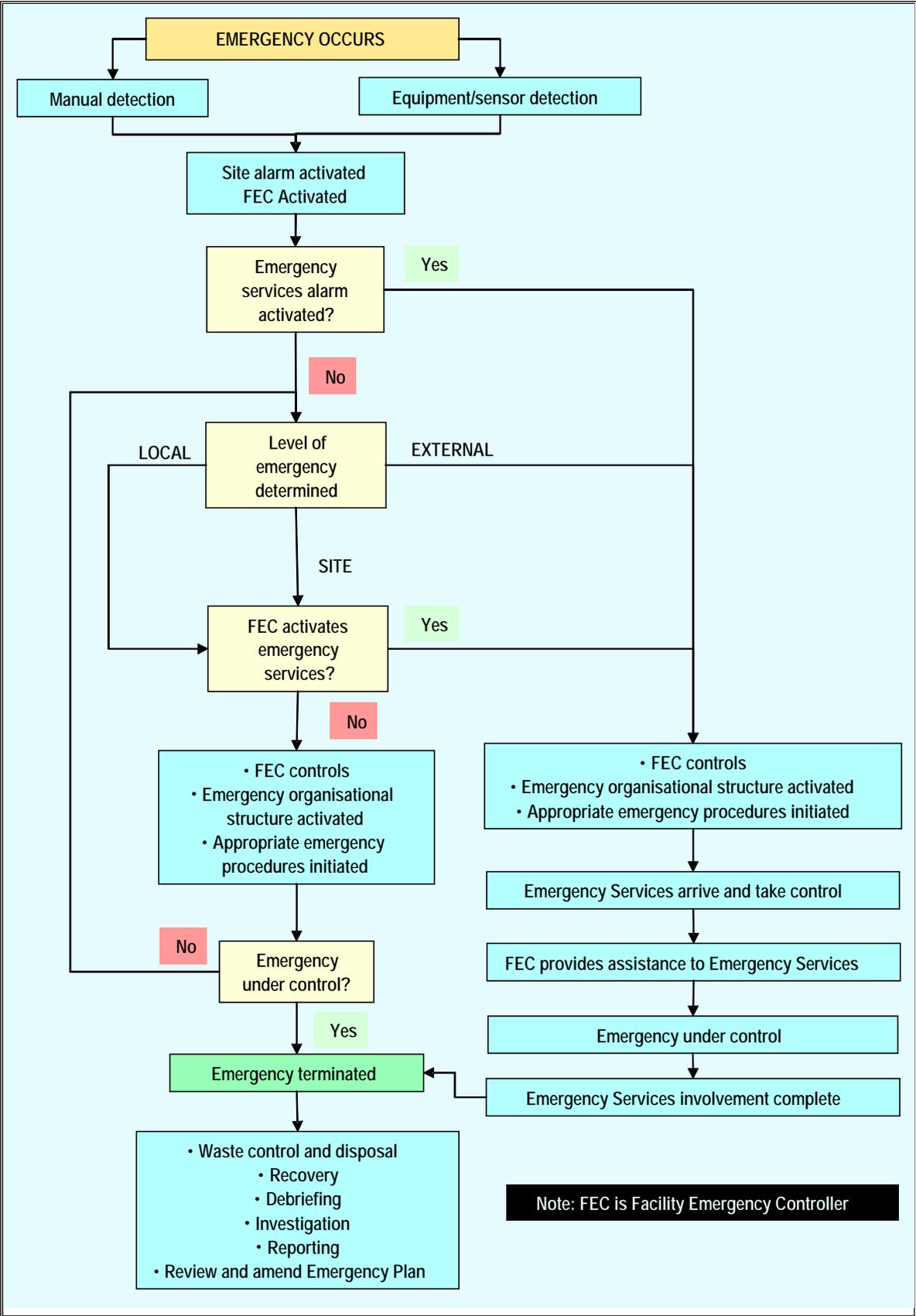
4.11.3 Emergency Alarm System

The facility should have an effective alarm and warning system for all levels of emergency. Issues to be considered for inclusion in the plan are:

- types of warning device(s) (flashing light, siren, distinctive tones, etc.);
- location of initiation points, warning devices, etc.;
- circumstances of initiation or raising the alarm;
- confirmation of initiation of alarm;
- method of establishing that there is an emergency and confirming its level;
- persons authorised to activate the emergency plan after alarm initiation;
- alarm indicators for ALERT, EVACUATE and ALL CLEAR (safe to re-enter);
- ability of the external alert alarm to be effective throughout the community information area;
- method, frequency and recording of testing;
- need for back-up systems for the alarm; and
- alarm operations if the facility is not staffed.

The alarm system should be tested regularly to confirm its intended function, for example, its ability to warn all relevant people under all operating conditions.

4.12 Activation of the Emergency Plan

The roles, responsibilities and duties of all personnel involved in activating the emergency plan when the initial alarm is raised should be defined. The plan should also indicate:

- the circumstances under which it is to be activated;
- the method of activation (including all designated methods for raising the initial warning and sounding the alarm);
- the means of alerting all relevant stakeholders;
- the arrangements for activation when the facility is not staffed (such as maintaining a regularly updated list of emergency contact numbers in an Emergency Service Information Package (ESIP) included as part of the supporting information referred to in section 4.16; and
- the means of addressing communication issues with the relevant emergency services and other stakeholders.

4.12.1 Initial Advice to the Emergency Services

The role, responsibilities and duties of the person nominated to report the emergency to the emergency services should be identified. The nature of the initial report and the information required should be determined following consultation with the Police, Fire Service, and other emergency services. The initial report would usually be made by dialling the emergency number (currently 000) and asking for the Fire Service.

The information provided in this report should include the following details, where available:

- name and location of the facility (suburb, street, nearest cross street to relevant site entry);
- number of injured persons or casualties and the nature of injuries;
- the type and scale of emergency including a brief description;
- hazards involved (including details of substances, namely UN Numbers, names of substances, quantities involved);

- telephone contact number (for any return messages);

- name of person making the call; and

- any other useful information (e.g. wind speed and wind direction, etc.).

4.12.2 Environmental Emergencies

The role, responsibilities and duties of the person nominated to report an environmental emergency to appropriate agencies should be identified. The nature of the initial report and the type of information required should be determined following consultation with these agencies.

Agencies that should be contacted may include, depending on the circumstances:

- the DECCW;

- Council; and

- the relevant Port Authority.

4.12.3 Special Cases

Bomb threats represent a special case. The initial report of a bomb threat should be made by dialling the emergency number and asking for the Police. Bomb threat procedure guidelines and a sample bomb threat checklist are provided in Australian Standards AS 3745 - *Emergency control organization and procedures for buildings, structures and workplaces* and AS 4083 - *Planning for emergencies - Health care facilities.*

4.13 Reporting of an Emergency

This refers to reporting to corporate personnel and government agencies or groups other than the Police, Fire and emergency services. The procedures for reporting emergencies and the role, responsibilities and duties of personnel reporting should be defined.

4.14 Termination of an Emergency

The plan should outline the procedures and responsibilities for terminating an emergency. These should be considered in terms of:

- the return of control to the facility emergency controller by the emergency services; and

- the declaration by the facility emergency controller that the emergency has been terminated.

4.15 Management of the Plan

The criteria for what is required to manage the plan and how it is to be achieved should be included in the plan. Further details on management of the plan are provided in Section 5.

4.16 Supporting Information

Information supporting the plan and essential for the emergency services need to be included as an attachment to the plan and should also be available as a separate information package to be given to the emergency responders when responding to an emergency at the site. This supporting information must be prepared in consultation with the emergency services to ensure that it meets their needs. Information required to support the plan includes:

- safety, health and environment information;

- the location map;

- the site layout plan;

- a list of emergency contact phone numbers; and

- relevant information on emergency resources and emergency equipment.

This information should be included as an attachment to the plan and should also be available as a separate information package to be given to the emergency services when responding to an emergency at the site.

4.16.1 Emergency Services Information Package

In NSW, there is a formal requirement for provision of an Emergency Services Information Package (ESIP).

The ESIP is a removable inclusion at the front of the Emergency Plan that contains concise relevant information to allow emergency services to commence initial combat operations. The ESIP must have all pages laminated so that it is durable in harsh environments.

The ESIP should include:

- a company letterhead as a title page displaying business address, PO Box, Head Office address, two emergency contacts (names, corporate positions, business and after hours contact numbers), date prepared and the location of any manifests, emergency plans and Material Safety Data Sheets (MSDS) held on site;

- two (2) copies of a scaled site plan (A3 minimum size); the NSWFB G*uideline for Tactical Plans* and WorkCover *Code of Practice - Storage and Handling of Dangerous Goods* should be used as a guide. In addition to the information required by those documents, the site plan should also include assembly points, any dangerous goods ventilation points and details of containment (e.g. bunding), drain isolation and discharge points;

- a copy of the site's hydrant system block plan (if applicable);

- a current copy of the 'Acknowledgement of Notification of dangerous goods on premises' received from WorkCover (where applicable) **OR** similar concise list detailing location, quantity, class, and name of materials;

- details of any dangerous goods/hazardous materials manufactured/blended etc. on site for which the emergency services may not have access to a MSDS (if applicable); and

- highlighted details of any Class 4.2 or 4.3 dangerous goods, or any other substances that are reactive to water, on site (if applicable).

Such an ESIP can also satisfy the requirements for the provision of a manifest, as noted in Appendix 6.

4.16.2 Safety, Health and Environmental Information

The plan should identify the locations of, and allow for access to, relevant safety, health and environmental information to assist with managing the emergency. This may include copies of MSDS, registers, and exposure data for people and the environment, emergency service manifests, plans, neutralisation procedures, hazardous interactions and potential uncontrolled reactions. Safety information may also include summaries from the assessment of the consequences and impacts of potential incidents. This information should be located at a number of sites throughout the facility (including the facility emergency control centre - see Section 4.11.2) which should be marked on the site plan.

4.16.3 Location Maps

Location maps should be provided, detailing significant facility and local community features (See Appendix 4 for an example of a location Map). The location map(s) should include:

- name of the facility;

- street address of the facility (including the suburb or town);
- site boundaries;
- local neighbourhood details (covered by the hazard zone);
- main entry;
- alternative entrance(s);
- emergency access points;
- north point indicator;
- distance scale;
- location of alternative water supplies (lakes, creeks, reservoirs, etc.);
- location of stormwater drains adjacent to the site;
- location of any off-site retention basins and their volume;
- location of stormwater drain outlets, particularly if they enter waterways;
- land usage (e.g. residential, industrial, commercial, vacant, bushland, etc);
- places of possible concentrations of people (e.g. sports grounds, shopping centres);
- places of special interest in an emergency (e.g. major infrastructure, hospitals, child care facilities, schools, nursing homes); and
- site topography (including slope of land, nearby watercourses and environmentally sensitive sites, drainage systems including access points, etc.).

4.16.4 Site Layout Plans

The site layout plan should detail significant facility features including:

- site boundaries;
- roadways, buildings and major tanks (labelled or numbered);
- normal entrances and exits;
- emergency access points;
- grid references (if applicable);
- electrical supply isolation;
- gas supply isolation valves;
- town water isolation valves;
- stormwater drainage points;
- on site retention basins;
- open uncovered land that may act as run-off sinks;
- any wetlands or other environmentally sensitive areas on the site;
- sewage system outlets;
- emergency evacuation assembly points;
- first-aid stations;
- north point;
- distance scale;
- location of relevant emergency plan information and safety information;
- site topography (including bunding and site drainage);
- all hazardous materials under control of the facility (see Section 4.7.1);
- location of the facility emergency control centre; and

- location of emergency resources and equipment (e.g. neutralising agents, absorbents, fire water pumps, fire water valves, booster, etc).

See Appendix 5 for an example of a Site Layout Plan.

4.16.5 Emergency Contact Numbers

An easily accessible list of current emergency contact numbers should be provided, including:

- off-site emergency numbers;
- facility numbers;
- key facility personnel details (including job title, local extension and after-hours numbers);
- control rooms or distribution points;
- responsible officers (e.g. operations manager, production manager);
- Government, Local Authorities and other relevant statutory agencies;
- other company offices (head office, regional office, etc.);
- mutual aid organisations;
- water, gas and electricity supply authorities and other utility supplies such as telecommunications;
- specialist response services (e.g. in relation to an oil spill or an emergency concerning a ship in port);
- neighbours, including closely located facilities;
- community representatives and other places of special interest such as schools, hospitals, etc.
- contractors and material and equipment suppliers;
- legal adviser(s);
- industry organisations and unions; and
- media liaison organisations.

4.16.6 Other Supporting Information

Other information required to support the plan and assist the facility emergency controller and the emergency services should be identified and provided. This may include:

- capacities of primary and secondary containment systems (e.g. volume available for fire water retention);
- drainage plans covering stormwater, effluent and sewage layout and access points covering the facility and nearby areas;
- maps and information on the facility water reticulation system (including firewater mains, ring mains layout, pumps, boosters, hydrants, hose reel facilities, foam supplies, sprinkler control systems and the location of hydrants in the near vicinity of the facility);
- safety, health and environmental emergency information for hazardous materials on-site;
- decontamination procedures for exposed personnel on-site;
- information on the impacts of hazardous materials on people, property and the environment that may assist the management of the emergency;

- information on, and location of, specialised fire suppression and mitigation equipment;

- any backup supplies of equipment, materials or services, (e.g., stock of fire fighting foam or an uninterruptible power supply (UPS)

- conditions that may yield hazardous interactions and uncontrolled reactions; and

- copies of the emergency plan and other information vital to executing the plan.

4.17 Glossary of Terms and Abbreviations

A glossary should be prepared that explains special terms, titles or personnel, names of parts of the facility and abbreviations used in the emergency plan.

5 Management of the Emergency Plan

<div style="border:1px solid; background:#ffffcc; padding:10px;">

SECTION SUMMARY

The emergency plan is part of the overall site safety management system and must be maintained and supported accordingly. All people involved in its implementation need to be trained and regularly retrained and relevant information about the plan should be communicated to both internal and external stakeholders.

Particular care needs to be taken to ensure that resources are maintained, records are kept and that proper document control procedures are in place.

It is essential that the plan be regularly tested and reviewed and that the plan be updated to take into account the outcome of the testing as well as investigation of any incidents.

KEY MESSAGE

- An emergency plan is only as effective as its monitoring and testing.

</div>

5.1 Introduction

To remain a living document, the emergency plan must be properly supported and managed. It should be incorporated into the safety management system to ensure its continued effectiveness. The system should include measures to promote awareness and understanding of the plan (such as training and education), control measures (such as record-keeping), and evaluation measures (such as regular monitoring and review).

5.2 Training and Education

All persons on-site (including visitors and contractors) should be provided with induction, education and ongoing training so that they have a general awareness of the plan and the capability to undertake their roles and responsibilities in the event of an emergency. Training programs should be based on trainees' identified needs and should be modified on the basis of their evaluations of the training provided. Areas to be covered should include:

- general duties, roles and responsibilities under the plan;
- emergency functions of the organisational structure;
- emergency procedures; and
- emergency resources.

Training and education should be competency-based, enabling personnel to develop skills in the use of emergency equipment and a working knowledge of emergency procedures. The training program should provide access to information for designated personnel on the potential impacts of the range of emergencies identified; i.e., several key personnel at the facility should have developed an understanding of what could happen if things do go wrong.

All persons within the community information area should be provided with information on the appropriate actions to be taken during an emergency and the means by which they will be warned and kept informed during an emergency. (See also Section 3.3.2).

5.3   Support Action

In order to demonstrate and foster an ongoing commitment to the emergency plan, the facility should develop and maintain support policies and procedures. This should involve:

- raising and maintaining an awareness of the emergency plan;
- maintaining on-going training and education;
- ensuring that the plan is updated as required; and
- ensuring that the appropriate information is communicated to all stakeholders, including the community, the local emergency services and the Local Emergency Management Committee.

Continued communication with the community is also required to ensure that a high level of awareness is maintained. For example, a facility should ensure that, if there is an emergency action card, the latest version is available and is also provided to new residents in the community.

5.4   Operational Control

Controls should be established and maintained to ensure that the policy, objectives and targets of the emergency plan can be met. This should include ensuring that all equipment and resources are available, fully maintained and in a state of operational readiness at all times. Checks will include ensuring that:

- emergency resources are not located in the hazard zone and are accessible;
- perishables (e.g. batteries) are serviceable and spares are available;
- materials that have been consumed have been replaced (e.g. foam, neutralising agents); and
- new staff is issued with emergency protective equipment.

5.5   Record Keeping

Records, which are an integral part of the facility's management system, should be retained to verify the adequacy of the system.

Circumstances for which records should be kept include:

- all induction programs and on-going training (including details of personnel trained);
- desk-top simulations and practical exercises at the facility;
- all near-misses and incidents at a facility;
- testing of the plan (including the dates of testing, methods, personnel responsible, and the results of testing);
- the results of monitoring;
- the results of audits; and
- management reviews.

5.6   Documentation and Documentation Control

Documentation should contain sufficient detail to describe the core elements of the emergency plan. It may include directions on where to find more detailed information not included in the plan, such as information available on palm cards for the use of key personnel during an emergency.

The management system should control the distribution, presentation, revision, and accessibility of the plan and any supplementary information, such as palm card

instructions. The system should ensure that all official copies of the document are the latest version. All superseded copies should be accounted for and filed or disposed of, as appropriate.

5.7 Investigation of an Emergency

Policies should be developed in relation to the investigation of emergencies in order to communicate the lessons learned. The role, responsibilities and duties of personnel in relation to investigating incidents should be defined.

Consideration should be given to issues such as:

- official investigations (e.g. by the Police, Fire Service or Coroner);
- the preservation of evidence for the investigation;
- consultation (including debriefings) with facility personnel, the community, Police, Fire and other emergency services, agencies and groups;
- legal responsibilities to notify the authorities under relevant regulatory requirements; and
- communicating the findings to stakeholders.

The investigation should focus on identifying opportunities to improve the effectiveness of the emergency plan. It should include details of:

- an analysis of the causes and contributing factors of the incident;
- the steps taken to mitigate the impacts;
- the provisions made to prevent a recurrence of the incident;
- the effectiveness of existing emergency procedures and lessons learnt; and
- all available data useful for assessing possible long-term impacts on facility personnel, the community and the environment.

5.8 Exercises and Testing of the Plan

The emergency plan should be tested when first developed, and then afterwards at suitable intervals to enable deficiencies to be identified and corrected. The two usual methods of testing are desktop simulations and practical exercises or drills. Testing should consider all components of the plan, including the effectiveness of training.

5.9 Monitoring and Review

The emergency plan should be reviewed at regular intervals to ensure its continued suitability and effectiveness.

Reviews could also be initiated by:

- changing legislation;
- advances in technology and equipment;
- changes in organisational direction;
- changes in products and activities;
- lessons from incidents; and
- findings of audits, reporting and communication.

It is essential to ensure that the "Management of Change" system in the organisation prompts the need for the review of the emergency plan. Reviews would include an evaluation of the appropriateness of the objectives, targets and performance measures of the plan.

5.10 Auditing

Audits of the emergency plan should be conducted on a periodic basis to determine whether the system conforms to the stated aims and objectives and has been properly implemented and managed. The frequency of audits should be guided by the nature of the facility and the results of previous audits.

5.11 Updating of the Plan

The plan should be tested and reviewed regularly, and revised as necessary. It should be updated when:

- testing of the plan identifies shortcomings or omissions;

- modifications or alterations occur at the facility;

- the type and quantities of hazardous materials on-site change significantly;

- an incident or near miss indicates the need to do so;

- changes to surrounding land use impact upon the emergency plan; or

- changes occur that will impact on the execution of the plan, such as resources, safety systems, personnel and contact numbers.

Temporary modifications to the plan should be considered when undertaking non-routine activities at the hazardous facility, such as maintenance, construction, and start-up or shut-down. The potential for accidents increases during such activities, which often involve extra personnel on-site. In the case of construction and maintenance, there is likely to be an increase in heavy vehicle traffic within the site, and in the lifting and moving of process equipment. Each of these activities introduces potential initiating events not present during normal operation. During start-up and shut-down procedures, there is a higher potential for human error as personnel are undertaking less familiar activities.

By constant monitoring, review and auditing, the plan will remain a dynamic document, alert to the needs of all stakeholders and responsive to changing circumstances.

Appendix 1

Glossary of Terms

ADG Code: Australian Code for the Transport of Dangerous Goods by Road and Rail published by the National Transport Commission, Commonwealth of Australia.

BLEVE: Boiling Liquid Expanding Vapour Explosion, which refers to the sudden rupture (due to fire impingement) of a vessel/system containing liquefied flammable gas under pressure. The immediate ignition of the expanding fuel-air mixture leads to intense combustion creating a fireball, a blast wave and potential missile damage.

CAS No: Chemical Abstracts Service Number - used to identify specific chemicals.

Combat Agency: means the agency identified in DISPLAN as the agency primarily responsible for controlling the response to a particular emergency.

community information area: an area surrounding the hazardous facility in which people are likely to be affected in the event of an accident.

competency-based training: training which focuses on the competencies gained by the trainee rather than on the training process itself.

consequence: the expected physical result of an incident (e.g. gas or liquid release, fire, explosion, overpressure in vessel, discharge of contaminant into a waterway), including the characteristic of this physical result that causes harm to people, property and the environment (e.g. heat radiation, explosion overpressure, concentration of toxic gas, contamination of habitat).

emergency: an incident at a hazardous facility requiring activation of the emergency plan.

emergency services manifest(s): a manifest to inform the Police, Fire Service and other emergency services of the types, quantities and locations of stored hazardous substances. Schedule 7 of the NSW *Occupational Health and Safety Regulation 2001* describes the information that should be in the manifest of site holding dangerous goods.

environmental receptors: the various components of the surrounding environment including air, water systems, land, flora and fauna which may suffer a deleterious impact from a contaminant.

ERPGs: Emergency Response Planning Guidelines which are guidelines for air contaminants published by the American Industrial Hygiene Association.

facility emergency control centre (FECC): an area where designated personnel coordinate information, develop strategies for addressing the media and government agencies, handle logistical support for the response team, and perform management functions. A centralised support facility allows emergency managers and staff to contend with incident issues more effectively.

FECC: see facility emergency control centre.

hazard(s): a situation or an intrinsic property with the potential to cause harm to people, property or the built or natural environment.

hazard zone: an area surrounding the hazardous facility where the consequences of a particular incident may impact on people, property and the environment.

hazardous facility: a facility which incorporates hazards which may pose a significant risk to the employees in the facility, the surrounding community and environment, and/or the facility itself.

hazardous material(s): any material which, because of its chemical, biochemical, microbiological or radiological properties, temperature or state of compression, could in sufficient quantity or concentration, cause harm to people, property or the environment.

HAZCHEM Code: the emergency action code associated with dangerous goods.

HAZOP: Hazard and Operability Study.

Heat Flux: is the heat per unit area, usually expressed in kilowatts per square metres (kW/m^2)

IDLH: Immediately Dangerous to Life or Health. An IDLH exposure condition is a condition that poses a threat of exposure to air-borne contaminants when that exposure is likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from such an environment.

impact: the physical damage to people, property or the environment from the consequences of an incident (e.g. property damage, injury, fatality, fish kill).

incident(s): a deviation from the intended operating conditions at a hazardous facility that has the potential to result in an emergency (e.g. hole in pipework or vessel, runaway reaction, overfilling of pressure vessel).

knock-on effects: the triggering of secondary events (such as toxic releases) by a primary event (such as an explosion), such that the result is an increase in consequences or in the area of an impact zone.

kPa(g): kilopascals(gauge), units of pressure.

kW/m^2: kilowatts per square metre, unit of heat intensity.

LFL: lower flammable limit of a vapour or gas. The lowest concentration (lowest percentage of the substance in air) that will produce a flash of fire when an ignition source (heat, arc or flame) is present.

Major Accident:[4] An occurrence (including a major emission, loss of containment, fire, explosion or release of energy or projectiles) resulting from uncontrolled developments in the course of the operation of a major hazard facility and leading to serious danger or harm, whether immediate or delayed, to people or the environment.

Material Safety Data Sheet (MSDS): a document that describes the properties and uses of a substance, that is, the identity, chemical and physical properties, health hazard information, precautions for use, and safe handling information.

Operator: the person who has overall control of a Major Hazard Facility (MHF). A person in this case may be a natural person or an organisation.

overpressure: the pressure developed above atmospheric pressure at any stage or location from a blast wave or pressure.

ppm: parts per million, unit expressing concentration

protect-in-place: the concept of sheltering people when an evacuation would cause or threaten greater harm.

risk: the likelihood of harm occurring from a hazard.

risk assessment: the evaluation of the likelihood of undesired events and the likelihood of harm or damage being caused, together with the value judgments made concerning the significance of the results.

sensitive environmental receptors: an environmental receptor which is likely to suffer a deleterious impact from a contaminant.

sensitive land use: land use where there are concentrations of vulnerable people who are not capable of taking protective action for themselves during an emergency. This will include schools, child care centres, nursing homes, aged persons accommodation, hospitals, prisons and special care centres.

---

4   As defined in clause 75A of the NSW *Occupational Health and Safety Regulation 2001*.

tabard: a short tunic, open at the sides, with identifying markings.

UN No.: United Nations Number. In relation to dangerous goods, the UN No. means the number assigned to the goods by the UN Committee of Experts on the Transport of Dangerous Goods and published in the UN Recommendations as in force from time to time and are listed in the Australian Dangerous Goods Code.

unstable material: a material that will vigorously polymerize, decompose or condense, become self reactive, react violently with water, or otherwise undergo a violent chemical change under conditions of shock, pressure, or temperature.

Appendix 2

Emergency Planning Checklist

The following checklist is a quick ready reference to ascertain whether the plan has addressed the fundamental concepts of emergency planning. The questions, which are applicable to large and small facilities, refer to all important matters that should be considered and, if appropriate, addressed in the emergency plan.

GENERAL	
Does the plan: • fully prepare the facility for an emergency? • satisfy the needs of the facility? • provide a flexible and simple approach? • readily accommodate change? • have the full support of senior management?	
CONSULTATION	
Have the key stakeholders in the emergency planning process been identified and listed?	
Have the key stakeholders been consulted through all phases of the emergency planning process?	
Have the needs and concerns of all stakeholders been addressed?	
Has the emergency plan been communicated to all stakeholders?	
Are the stakeholders satisfied?	
THE AIMS AND OBJECTIVES	
Does the aim reflect the reasons for developing the plan?	
Do the objectives list and prioritise the outcomes required?	
Do the objectives provide specifications for developing the emergency plan?	
THE PARAMETERS	
Does the definition of an emergency situation: • cover all incidents that would require activation of the emergency plan? • identify the types of incidents that would not be defined as an emergency situation?	
Do the types and levels of emergency identified cover all possible incidents?	
Does the plan: • identify all hazards which will have an impact? • recognise the importance of all hazards? • determine the potential impact on people, property and the environment?	

Are the incidents selected to assess consequences and impacts representative of the entire range?	
Are all areas on which an incident could impact covered by the plan?	
Is the basis for determining the area of impact of an emergency provided?	
Are all people on whom an incident could impact covered by the emergency plan?	
Have all specific groups of people and their numbers been identified?	
Are the assumptions in formulating the plan listed and are they reasonable?	
Do the contingency plans developed provide adequate coverage for failed assumptions?	
THE SYSTEM	
Does the system address the objectives of the plan?	
Does the system define its main focus and priorities?	
Is the system capable of: • managing an emergency until the emergency services assume control? • providing support and information to the emergency services and other external agencies? • managing smaller emergencies and environmental emergencies when the emergency services do not attend?	
Is the system automatically activated when the alarm is raised?	
Have the functions to be undertaken during an emergency been identified and listed?	
Have facility personnel been assigned to all functions identified?	
Is there an organisational structure in place with a clear chain of command?	
Does the organisational structure: • make adequate arrangements for back-up? • provide for emergencies under all circumstances, including out-of-hours?	
Have emergency procedures been developed and documented for all emergency activities?	
Are the emergency procedures: • safe to undertake? • supported by adequate resources? • achievable, taking into account potentially life-threatening situations?	
Are the emergency resources provided: • adequate to support the emergency functions and emergency procedures? • accessible during emergencies? • functioning at all times as intended?	

Does the system provide user-friendly and adequate information to manage an emergency? • to facility personnel responding to the incident; • to emergency services at time of the emergency.	
Do key personnel have the defined level of knowledge and skills necessary to carry out their responsibilities?	
MANAGEMENT OF THE PLAN	
Does the management of the plan: • allow for regular monitoring, testing, auditing and review of the emergency plan? • provide training and education for employees to a defined level of competency to fulfil their roles and responsibilities in the event of an emergency? • provide training in emergency procedures and in the use of emergency resources? • provide for the provision of information and promote the on-going awareness of the plan to local emergency services, the community and other stakeholders? • provide for regular exercises to be undertaken? • provide for the serviceability and adequate supply of emergency resources? • allow for the emergency plan to be updated as necessary? • allow for the emergency plan to be reviewed and amended as part of the system for the "Management of Change" • allow for records of activities to be documented? • allow for emergencies to be investigated and the findings communicated?	

Appendix 3

Emergency Functions and Organisation

The functions listed below are suggested functions that may be used as the basis for a facility's emergency response organisation. The information provided in this section gives guidance on the roles, responsibilities, duties, and the expectations that are associated with these functions. The suggested functions are:

- facility emergency response;
- damage control;
- facility emergency support;
- operations control;
- protecting people;
- protecting the environment;
- facility security and traffic control;
- communications, including communication with the emergency services; and
- public relations and media relations.

Facility Emergency Response

The facility emergency response function involves determining the measures required to reduce or terminate identified causes of the emergency (including suppression of fire, isolation of fuel, stemming of toxic release, etc.) and to minimise environmental damage. These tasks should be outlined in the plan and should state the actions to be taken before the arrival of the emergency services. The plan should also account for variations in staffing levels at the facility (e.g. an unstaffed facility, or night-shift when there are fewer staff available).

Details may include information on automatic shutdown systems, and manual control and response procedures. The following are examples of control measures:

- To control fires, the fuel supply should be isolated and the spread of the fire limited by cooling the adjacent areas. The likelihood of re-ignition sources being present should be assessed.
- To control toxic gas release, water screens should be activated.
- To control spillage and containment, bunding procedures should be adopted.
- To control any gas or liquid release, control/isolation valves should be activated.
- To control wastes and firewater run-off generated during the emergency, drainage systems should be isolated.

Damage Control

The damage control function aims to minimise the damage caused by an incident, and to prevent (or minimise) any secondary damage (i.e. knock-on or domino effects).

The details of damage control measures provided in the plan will depend on the nature and types of emergencies identified. Consideration should be given to people, property and the environment in the vicinity of the incident, and in other parts of the facility and neighbouring facilities. In some cases, this function may be combined with facility emergency response. Examples of damage control measures include:

- protection of neighbouring tanks from pool fires and jet fires;

- protection systems which can be activated to protect people, the facility, equipment, stores and the environment;

- measures available to ensure safe operating conditions of the facility in the case of interruption or failure of services (e.g. electricity, water, gas supply, communication system); and

- protection and preservation of vital company records.

Facility Emergency Support

The facility emergency support function is responsible for operation of the facility emergency control centre, the provision of supporting information, and the provision of additional resources, materials and equipment as necessary to support the management of the emergency. Another important function is to maintain a record of the emergency, including the time at which specific actions and events occur.

Operations Control

The aim of the operations control function is to manage the safe operation of the facility (or parts of the facility) not directly involved in the emergency. Operations that should be considered include those that may be affected by, or which may affect, the emergency. This function includes managing the continuing operation and staged shut-down (if required) of processes which cannot be immediately shut-down safely.

Specific activities may include:

- a staged shut-down over a period of time; or

- the maintenance of operation at normal capacity, or a reduced capacity, in order to maintain the integrity and safety of the processes and plant.

Protecting People

The role, responsibilities and duties of those responsible for protecting people and responding to medical needs during and after the emergency should be identified.

The plan should identify the facility's strategy for protecting people during an emergency. It should address the provision of advice to people on-site and off-site as to the appropriate action to be taken when there is a threat to their safety and health. This function is responsible for ensuring that this information is communicated and acted upon during an emergency, prior to the arrival of the emergency services.

Protective actions may include stand-by alerts, partial evacuations, full evacuation, or the use of shelters and havens. The actions taken will depend on the nature, scale and the likely duration of the emergency. Appropriate methods of protection may be determined by reference to the levels of emergency (see Section 3.6.1.2) and the control zones for various emergencies.

In addition, health issues should be considered in broad terms. First-aid considerations are of vital importance. However, there are other issues that should be addressed, such as long-term impacts of exposure and trauma.

A number of specific aspects that need to be considered are outlined in this section. However, not all of these matters will need to be considered for all facilities (or even all emergencies), and there may be other relevant issues for particular facilities that have not been identified.

Protecting People On-Site

The role, responsibilities and duties of the person in charge of on-site safety, and all other on-site personnel in relation to personal protection, should be specified. Part of this function is to oversee and manage roll-call and search and rescue activities.

In addition to considering the protection of on-site personnel, the protection of people involved in the facility emergency response needs to be considered. Factors that need

to be taken into account include estimating the likely impacts of the incident, determining appropriate control zones, and assessing the adequacy of protective clothing and equipment.

Roll Call

The role, responsibilities and duties of the roll-call monitor should be defined. The system should ensure procedures for the safe evacuation of, and accounting for, all people on-site throughout the emergency. There also needs to be a system for identifying all people (including visitors and contractors) who are on-site.

Duties of the roll-call monitor may include:

- status reporting to the facility emergency controller;
- compilation of a list of persons on-site immediately prior to the emergency;
- compilation of lists of persons at normal work stations, assembly or sheltering points, and those who have left the facility;
- actions to be taken for those people not accounted for; and
- arrangements to respond to inquiries about all persons who may have been on-site.

Search and Rescue

Facility emergency personnel may be required to carry out some initial search and rescue activities. The role, responsibilities and duties of the search and rescue personnel should be stated. The plan should state the scope and limitations of these search and rescue procedures. For example, this activity should only be carried out to the point where the rescuers are not put at significant risk - their safety should not be compromised.

Protecting People Off-Site

The role, duties and responsibility of the person(s) initiating the off-site warning system should be defined. The plan should identify the means by which the facility operator will warn (and keep informed) people likely to be affected by the emergency. This should cover the activation of the warning system to alert people to take protective action. The key step is to determine when there is a threat to the community.

The evacuation of people outside the facility and the control of public roads, pedestrians and vehicles is the responsibility of the Police. Procedures should be established for liaison with the Police and Fire Service and for the provision of information which will assist in making decisions regarding public protection issues.

Medical Attention

Health issues should relate to both acute exposure and the potential long-term impacts from low levels of exposure. Consideration should also be given to the provision of trauma counselling and addressing the long-term impacts of the stresses induced by an emergency.

First-Aid

The role, responsibilities and duties of first-aid personnel should be defined. Suitably qualified facility personnel may be responsible for the provision of first-aid until the Ambulance (or other emergency service) arrives. Consultation with the Ambulance Service is recommended in determining the extent of the facility's response, including decontamination procedures required before patients can be treated by the ambulance service. The plan should document these responsibilities and state the methods of handling injured people. Training requirements and the first-aid resources provided should be detailed in the plan.

Other Health Issues

Other issues relating to health should also be considered. These may include estimating and recording the exposures during an incident and assessing their short-

term and long-term impacts. Continued health surveillance should be considered for all employees and members of the public exposed.

The plan may provide for a critical incident stress program that manages the stress-response syndrome through awareness of potential problems and proper stress debriefings by qualified personnel. This assists in dealing with the stress encountered and the impacts on both personal and professional life.

Protecting the Environment

Environmental issues that need to be considered include both the short-term and long-term impacts of the incident on the environment. Some impacts may not be immediately apparent, and a number of apparently minor incidents may cause cumulative impacts. The overall objective of this function is to minimise environmental harm due to the incident. Where appropriate guidance is available, practices or information provided by the NSW Department of Environment, Climate Change and Water should be followed when considering environmental issues.

Specific duties may include:

- closing all site drain valves (a visual inspection may be required);
- arranging for earth bunding of liquid spills or firewater run-off to minimise water and soil contamination;
- assisting emergency services personnel to identify and monitor airborne pollutants;
- advising on the potential environmental impacts of proposed response activities (e.g. use of neutralising agents); and
- liaising with environmental agencies.

Facility Security and Traffic Control

The role, responsibilities and duties of facility security and traffic controllers should be listed. Issues may include:

- access for emergency vehicles;
- means of controlling access to authorised people only;
- personnel permitted to remain during an evacuation (e.g. combatant authorities, carriers delivering emergency equipment and materials, etc.);
- methods of notifying the facility emergency controller of arrivals;
- any additional requirements for traffic movement on facility roadways; and
- broad indications of the way that the Police will control external roadways, pedestrians and vehicles.

Communications

The roles, responsibilities and duties of communications personnel should be defined and details provided of the equipment required to carry out these functions. Effective communications on-site and off-site are vital.

The communications process should include the identification of personnel involved, the provision of a communications centre (refer to Section 4.11.1), call signs, and details of the internal telephone network, including a list of telephone numbers. Details of the equipment provided for internal and external communications should be listed. Information should include the quantities and their location, type, limitations on use, and performance parameters. Consideration should be given to providing back-up equipment.

Public Relations and Media Liaison

The roles, responsibilities and duties of facility personnel involved in public relations and media liaison during an emergency should be described.

The appointment of a media liaison officer should be considered as a way of managing the release of information to the media. Information should be provided to the media only after consultation with the Police and Fire Service media liaison staff, the incident coordinator and the incident commander. Consideration should also be given to the timing of the release information to facility personnel. Topics for consideration might include:

- liaison with Police and Fire Service media staff before the release of any information to the media;

- the possible need to also liaise with NSW Government health and environmental media;

- the person(s) authorised to liaise with the media;

- company policies on information to be released;

- the training required for the media liaison person(s);

- the standard format of media releases;

- the provision of pre-prepared sample statements;

- community contact persons/organizations after the incident; and

- the process of community liaison after the incident.

Appendix 4

Example Location Map

Site location maps and plans should, wherever possible, include colour maps.

The following map shows the approximate area covered by the Department's Kurnell Land Use Safety Study, as shown by the dashed lines.

Appendix 5

Sample Site Layout Diagram

1900 N

RIVER ROAD

OFFICE ROAD

Administration office

1800 N

Raw material storage

① ② ③ ④
1 2 3 4

STREET

WATTLE STREET

Office
First Aid

Electrical mains connector box

Material Safety Data Sheets

Gate House

MAIN STREET

Raw material storage

⑤ ⑥
5 6

1700 N

ALPHA

Manufacturing Area

Finished Goods Warehouse

Town Water Connection Point

Town Gas Isolation Valve

No 2 Gate

7

1600 N

HENDERSON ROAD

1500 N

200 W

100 W

0

100 E

KEY

**ACME Co. Ltd
Site Layout**

Scale 1 cm = 50 m

1. Toluene
2. Acetone
3. TDI (toluene diisocyanate
4. MEK (methyl ethyl ketone)
5. Sulphuric acid (conc.)
6. Hydrochloric acid (conc)
7. Pesticides

(See body of text for materials list)

Appendix 6

Major Hazard Facilities

This Appendix summarises the main emergency planning regulatory requirements for Operators of Major Hazard Facilities under NSW occupational health and safety legislation.

Note: The emergency plan is a control measure.

	General requirements	Reference
1.	An emergency manifest to be provided and maintained.	174ZN, Sch 7
2.	The details of evacuation plans must be on display.	17
3.	A copy of the emergency plan must be readily available for use at the facility by the emergency services.	C2.2
4.	The operator must respond to incidents and serious incidents.	174ZO
5.	The emergency services must be informed, as soon as possible after becoming aware, of the likelihood of a major accident.	C2.7
6.	Spills of dangerous goods and effluent to be contained.	174Y
7.	Hazardous areas must be identified.	174U
8.	Risk assessments to be readily available to employees.	174ZX
9.	The fire protection system must be properly installed, tested and maintained.	174ZB, 136A(1)(m)
10.	The fire protection system must take into account the outcomes of the risk management process.	174ZB
11.	The fire protection system must capable of being used, without adaptation or modification, with the equipment used by Fire and Rescue NSW and the NSW Rural Fire Service.	174ZB
12.	The fire protection system must always be accessible to workers and to the relevant emergency services.	174ZB
13.	Should the fire protection system become inoperative, consequences and alternatives must be known.	174ZB
14.	Emergency services must be notified if there is a significant reduction in the effectiveness of the fire protection system.	174ZB
15.	Provision for other control measures must be made if the fire protection system becomes unserviceable or inoperative.	174ZB
16.	Arrangements must be made for: • the safe and rapid evacuation of people at the site; • emergency communications; • appropriate medical treatment of injured people; • safe shut down.	17, 174ZO
17.	The emergency planning provisions must be audited as emergency planning is part of the MHFs safety management	B1.6

	General requirements	Reference
	system.	
18.	The emergency plan must be regularly tested.	C2.3
19.	In addition to the regular testing, practical tests of the emergency response to specific potential major accidents must be held every 2 years. These practical tests should include the appropriate emergency services. The specific scenario to be tested must be decided in consultation with employees and the appropriate emergency services.	C2.3
20.	The emergency plan must be comprehensively reviewed every 5 years.	C2.1
21.	The emergency plan must be reviewed if there is a change in circumstances at the premises, or any adjacent premises, such as to raise the possibility of an emergency of a kind that is not dealt with by the plan.	174ZC, Exp 66
22.	The community in the area where a major accident may cause significant harm (identified in maps) must be informed of the actions to take and the procedures to follow if there is a major accident.	C2.5
23.	People in control of neighbouring sites must be informed of the actions that may be required if there is an emergency involving dangerous goods.	174ZC, Exp 66

	The emergency plan must:	Reference
1.	• be documented	B2.2
2.	• list and describe the emergency planning assumptions	B2.2
3.	• contain major accident pre-incident plans developed from the risk management process	B1.4
4.	• consider both on-site and off-site consequences from potential major accidents	B2.2
5.	• be developed in consultation with workers	s13
6.	• be developed with Fire and Rescue NSW/NSW Rural Fire Service	175R, Exp 66
7.	• be provided to Fire and Rescue NSW/NSW Rural Fire Service (the current version)	175R, Exp 66
8.	• deal with any emergency associated with the storage or handling (includes use) of dangerous goods	174ZC
9.	• be readily available for use by emergency services	C2.2
10.	• be used to prevent major accidents occurring at the facility	B2.2(c)
11.	• be used to minimise the consequences from major accidents	B2.2(c)
12.	• be readily accessible to workers who have a duty under plans	C4.2, C4.3
13.	• include plans for the provision of specialised medical treatment if such treatment may be required	B2.2
14.	• provide for appropriate medical treatment of injured people	17

		The emergency plan must:	Reference
15.	•	contain maps	
16.	–	identifying areas surrounding the MHF where a major accident may cause substantial harm	B2.2
17.	–	showing types of occupancies and their location where groups of people may be at a higher risk of harm because of limitations such as mobility, age or confinement in the map/s show the possible area of substantial harm	B2.2
18.	–	showing significant plant, infrastructure or utilities including in the map/s showing the areas surrounding the facility where a major accident may cause substantial harm	B2.2
19.	–	describing the nature of the of the occupancies surrounding the MHF	Sch 7
20.	–	showing the main entrance to the MHF and any other access points	Sch 7
21.	–	showing the location, storage type, depots numbers	Sch 7
22.	–	showing any other entrances that may be used to gain access to the site during an emergency	Sch 7
23.	–	including drainage diagrams showing the drains, their isolation points, and where they lead to (in particular any that leave the MHF)	Sch 7
24.	–	showing the location of the emergency manifest	Sch 7

	Training and record keeping	Reference
1.	Information, instruction and training must be provided to workers who may be exposed to a risk to health.	13(2)
2.	Records of induction training and other training related to dangerous goods must be kept for 5 years.	174ZV, 175ZC
3.	Document or other record created by an operator because of MHF requirements to be kept for at least 15 years.	175ZD
4.	Content of the emergency plan to be communicated to workers at the site.	174ZC
5.	Adequate information and training must be provided to any people expected to operate fire fighting, fire detection or suppression equipment.	136A(1)(a)

		Reporting incidents to WorkCover NSW	Reference
		Incidents to be reported are:	
1.	•	Serious incidents including major accidents	s86, 87, 344, Exp75
2.	•	Incidents including major accidents and near misses	s86, 341, Exp 75

Notes:

1. In the column headed reference an entry starting with s is a reference to a section in the *Occupational Health and Safety Act 2000.*
2. In the column headed reference an entry starting with a numeral is a clause in the *Occupational Health and Safety Regulation 2001*(NSW).
   http://www.legislation.nsw.gov.au/
3. In the column headed reference an entry starting with B or C is a reference to a paragraph in WorkCover's publication *Conditions and Requirements of Provisional Registration and of Registration (Catalogue No. WC05528).*
   http://www.workcover.nsw.gov.au/
4. In the column headed reference the entry Sch 7 means Schedule 7 to the *Occupational Health and Safety Regulation 2001.*
5. In the column headed reference an entry starting with Exp is a reference to the *Explosives Regulation 2005.*
6. Section 21 *Occupational Health and Safety Act 2000* places an obligation on workers to not interfere with or misuse anything provided in the interests of health, safety and welfare.

Appendix 7

References and Further Reading

1. Australia and New Zealand Hazardous Industry Planning Taskforce, 1998, *Emergency Planning - Guidelines for Hazardous Industry*, Department of Emergency Services, Queensland

2. American Industrial Hygiene Association. *Emergency Response Planning Guidelines (ERPGs)*

3. Canadian Standards Association (1995). ANS/CSA-Z731-95 *Emergency Planning for Industry*

4. Centre for Chemical Process Safety, American Institute of Chemical Engineers. (1995) Guidelines for Technical Planning for On-Site Emergencies. New York: CCPS –AICHE.

5. *Emergency Planning for Major Accidents – COMAH* Health and Safety Executive – UK (1999).

6. American Petroleum Institute (1990): API RP750, Management of Process Hazards.

Additional Information

Relevant DoP Publications

No. 1   -   Emergency Planning

No. 2   -   Fire Safety Study Guidelines

No. 3   -   Risk Assessment

No. 4   -   Risk Criteria for Land Use Safety Planning

No. 5   -   Hazard Audit Guidelines

No. 6   -   Hazard Analysis

No. 7   -   Construction Safety

No. 8   -   HAZOP Guidelines

No. 9   -   Safety Management

No. 10 -   Land Use Safety Planning

No. 11 -   Route Selection

No. 12 -   Hazards-Related Conditions of Consent

Other Publications:

Applying SEPP 33: Hazardous and Offensive Development Application Guidelines

Multi-level Risk Assessment

Locational Guideline: Liquefied Petroleum Gas Automotive Retail Outlets

Locational Guideline: Development in the Vicinity of Operating Coal Seam Methane Wells

Relevant Fire and Rescue NSW Publication

Policy No. 1 - Guidelines for Emergency Plans at Facilities Having Notifiable Quantities of Dangerous Goods.

Electronic copies of some of these publications are available at:
www.planning.nsw.gov.au