

# **GUIDE FOR MAJOR HAZARD FACILITIES**

EMERGENCY PLANS

MARCH 2012



**safe work australia**



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# 1. INTRODUCTION

This Guide provides practical guidance to operators of major hazard facilities (MHFs) in the preparation, implementation and testing of an emergency plan that will meet the requirements of the Work Health and Safety Regulations (the WHS Regulations).

An important element of any system for the prevention of major incidents is the establishment of a facility-specific emergency plan. Emergency planning seeks to minimise the effect of an incident both inside and outside a facility, and requires the timely application of defined procedures by people 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.

A major hazard facility's (MHF) emergency plan is intended to limit the magnitude and severity of the health and safety consequences of an incident, including all major incidents, both on-site and off-site. Therefore the plan must be appropriate to the hazards and risks of a facility and specific to that facility.

An emergency plan may also be aimed at limiting or managing the effects of consequences on property or the environment. Further, emergencies may occur that are not associated with hazardous chemicals, such as those arising from natural events (e.g. flood or fire). It is advisable that a facility not have multiple plans—a single plan facilitates rapid response and avoids confusion about which plan should be executed in the event of a particular type of emergency. Hence, this Guide contains information beyond that needed to meet the requirement of the WHS Regulations, such as dealing with emergencies with an environmental impact or those caused by natural hazards.

This Guide is divided into five sections:

- an introduction that describes the need for emergency planning at a facility
- an outline of the important principles to be considered when establishing an emergency plan at a facility
- 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
- guidance on writing the emergency plan to ensure that all issues are covered and explained in a simple and clear format
- management of the plan, including issues such as testing the plan, providing training and education, and updating the plan when appropriate.

Emergency plans are an essential part—but only a part—of the total emergency planning framework. Where there are concentrations of hazardous facilities in an area, incident- and area-specific plans are also needed. The facility plan needs to be compatible and integrated with relevant statutory emergency management arrangements, such as local emergency management committees. In addition, emergency service agencies have their own plans and procedures for responding to incidents and emergencies.

By focussing on the elements contained in this Guide, 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 major incidents and other emergencies, both on-site and off-site
- integrated into the facility's safety management system (SMS)

- developed in consultation with workers, emergency services and people likely to be affected by the consequences of a major incident, including other closely located facilities
- understood by workers, visitors and other people likely to be affected
- subject to testing, review and updating at appropriate intervals.

In addition to the broad guidance provided here, there may be jurisdiction-specific requirements that must be addressed in preparing the emergency plan. Operators must consult with the relevant emergency services organisations in their own jurisdiction to ensure these requirements are satisfied.

It is expected 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
- environmental management systems.

This Guide forms part of a set of guidance material for MHFs that includes information on:

- Notification and Determination
- Safety Management Systems
- Developing a Safety Case Outline
- Preparation of a Safety Case
- Safety Case: Demonstrating the Adequacy of Safety Management and Control Measures
- Information, Training and Instruction for Workers and Others at the Facility
- Providing Information to the Community
- Safety Assessment.

### **WHAT DO THE REGULATIONS REQUIRE?**

The operator of a determined MHF must prepare an emergency plan for the facility that:

- addresses all health and safety consequences of a major incident occurring
- includes all matters specified in Schedule 16
- provides for testing of emergency procedures, including the frequency of testing.

The operator must keep a copy of the emergency plan at the facility and must consult the workers when preparing the emergency plan. Schedule 16 of the WHS Regulations specifies the matters that must be included in the emergency plan. Further details of relevant regulations are set out in Appendix A.

Relevant definitions are set out in Appendix B.

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- 1 In these guidelines, the word “must” and its synonyms are used when describing requirements prescribed by the Regulations. “Should” and similar terms are used in describing components of the emergency plan that represent good practice without necessarily being mandated by the Regulations.

## 2. EMERGENCY PLANNING PRINCIPLES

The key requirement for preparing an emergency plan is that the plan is tailored for the facility to which it applies. 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. It should be relevant, realistic and sufficiently clear to be understood by all users and reviewers of the plan. A less hazardous facility may require a simple emergency plan, while a complex or more hazardous facility may require a detailed and extensive plan, involving more people and organisations in the development and consultation phases of the plan.

The emergency plan must be properly integrated with the facility's safety management system (SMS). 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 and decision-making processes. 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.

### 2.1 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 that harms (or threatens to harm) people, property or the environment. In this Guide, 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 this guideline.

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 incidents or circumstances 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 be 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 use 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.

### 2.2 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 people 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 emergency services organisations 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.

### 2.3 Relationship with other management systems

Emergency planning is an element of the safety management system and complements systems for environmental management and risk management. Common elements of these systems include the identification of hazards and risks, training and education, and consultation.

#### **SAFETY MANAGEMENT SYSTEM**

As the title suggests, the SMS 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 SMS.

#### **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, emergencies with potential for environmental impact would be identified and procedures determined to respond and minimise the impact on the environment. Where appropriate guidance is available, such as from environmental protection agencies, it should be followed when addressing environmental issues in the emergency planning process.

#### **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 residual risk that remains.

### **EMERGENCY MANAGEMENT SYSTEM**

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

Emergency management involves a cyclical process of four phases:

- prevention: regulatory, physical or operational 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
- 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.



### 3. PREPARATION FOR THE EMERGENCY PLAN

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 to an emergency in a way that leads to the most effective outcome possible under the circumstances. The plan's coverage should therefore be comprehensive, while keeping the structure as concise, simple and flexible as possible. 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 process as illustrated in Figure 1. All of the stages are inter-related and plan details should be continually evaluated and revised as appropriate.

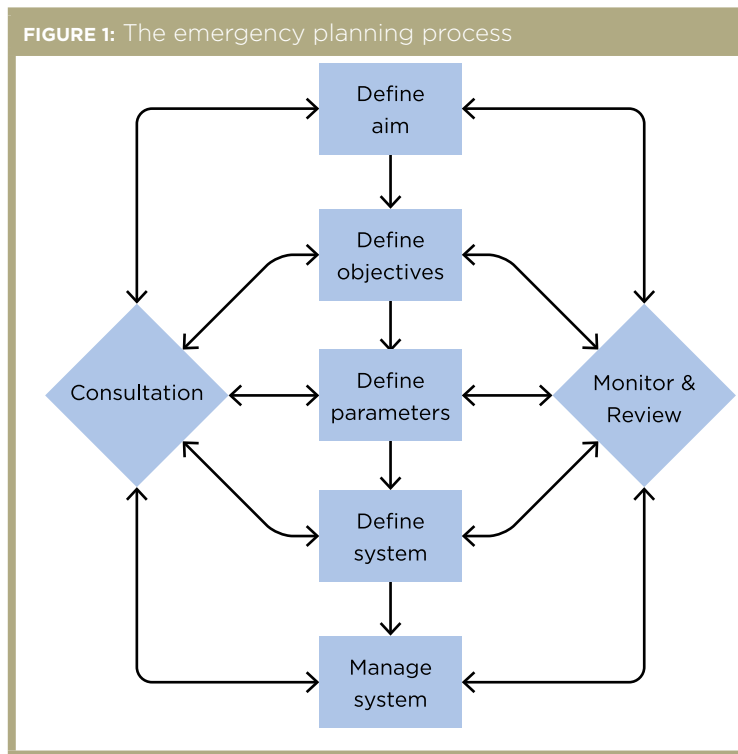
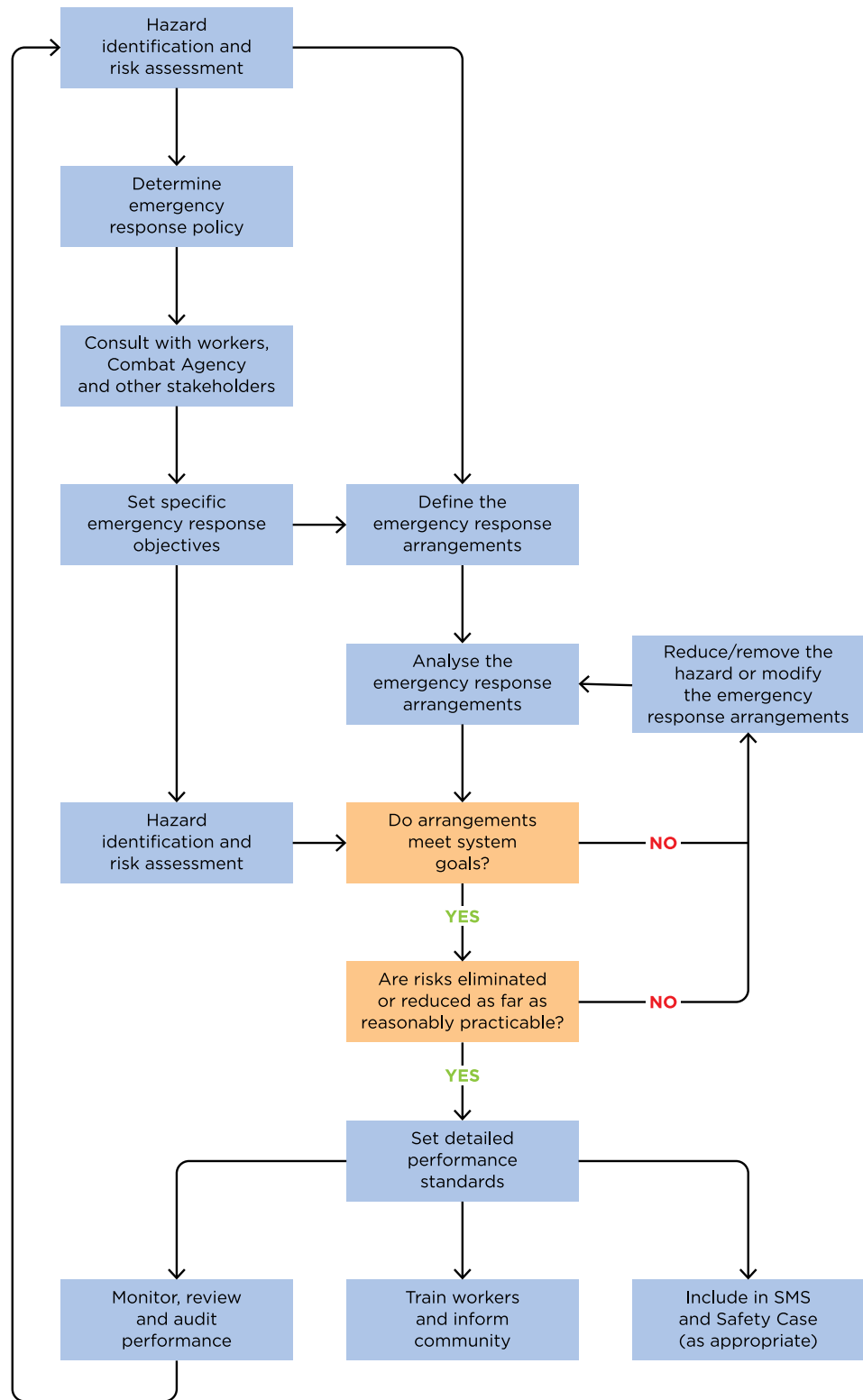


Figure 2 outlines a systematic process for formulating an appropriate emergency plan. The process is discussed in more detail in the text that follows.

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.

### 3. PREPARATION FOR THE EMERGENCY PLAN



**Figure 2:** Emergency plan preparation

### 3.1 Consultation

Consultation is a key requirement for 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.

There are a number of specific consultation obligations for operators of determined and licensed MHFs regarding emergency plans prepared under the Regulations. Regulation 557 requires the operator of a determined MHF to consult with emergency services and the local authority in preparing the emergency plan. Under Regulation 557, the operator must address recommendations made by the consulted emergency service organisation in relation to the testing of the plan and what incidents or events should be notified to the emergency service organisation. The operator must have regard to any other advice and recommendations provided. Regulation 569(4) requires similar consultation for a licensed MHF when reviewing and revising the emergency plan. Consultation with workers is integral to Part 9.5 of the regulations and specifically mandated under Regulation 575 when preparing, testing and implementing emergency plans.

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 ongoing 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.

#### **WORKERS**

Workers must be consulted extensively during the emergency planning process. Not only is this consultation with workers a regulatory requirement, it ensures that their intimate knowledge of the facility and its operations is incorporated into the development of the emergency plan and 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 workers should be actively pursued. For example, they should be involved in preparing and conducting exercises in order to test the capability of the plan. Debriefings following these exercises provide participants with an opportunity to indicate the problems encountered and suggest possible solutions.

### 3. PREPARATION FOR THE EMERGENCY PLAN

#### **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, but 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, including MHFs
- local mutual aid groups
- managers of sensitive environmental sites
- facilities accommodating large numbers of people (e.g. commercial or shopping centres, motels and recreational facilities)
- 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 people, 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.

Regulations 572 and 573 include specific requirements about information that must be provided to the community and others in relation to MHF emergencies. These are minimum requirements.

#### **EXTERNAL AGENCIES AND OTHER GROUPS**

Police, Fire and other emergency services, local authorities, and safety, health and environmental agencies (both government and non-government) should be consulted throughout the emergency planning process.

Regulation 557 requires MHF operators to consult with the emergency service organisations that have responsibility for the area in which the facility is located and address any recommendations made by those authorities. The same applies to consultation with the local authority in relation to the off-site health and safety consequences of a major incident occurring.

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 in 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 MHFs 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.

The facility operator should liaise closely with the relevant local emergency management authority so that measures developed to respond to a major emergency at the facility are incorporated into the local authority's regional plan and are complementary with arrangements made for other types of hazards.

#### 3.2 Defining the aim of the plan

The aim of an emergency plan should be expressed as a broad statement of 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 all emergencies that could affect people, property and/or the environment
- to minimise adverse impacts on people, property and the environment
- to ensure that the requirements of the regulations are fully met.

#### 3.3 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
- to protect emergency responders, personnel and the community from harm.

#### 3.4 Defining the parameters of the plan

In preparing an emergency plan, the parameters that will characterise the framework for developing the plan should be defined. 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 deactivated when the emergency situation ceases to exist.

### 3. PREPARATION FOR THE EMERGENCY PLAN

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. This is an output of the hazard identification and safety assessment requirement (see regulations 554, 555, 564 and 569). The emergency plan must address all identified major incidents and adequately cater for all emergencies arising from such incidents.

In addition, any assumptions that might influence the system to be developed to manage an emergency should be identified and evaluated.

#### BACKGROUND INFORMATION

Background information about a facility and its hazards is required to establish the parameters of the plan. Information requirements set out in the Regulations cover:

- the location of the facility, including its street address and the nearest intersection (if any)
- a detailed map (see Appendix D):
  - showing the site of the major hazard facility
  - showing land use and occupancy surrounding the facility, and any other closely located major hazard facilities and hazardous chemical storage sites
  - identifying all potentially hazardous inventories in the area that are known to the operator and the location of all staging points for emergency services
- an inventory of all hazardous chemicals on-site, or likely to be on-site, and their location (see Appendix E)
- a brief description of the nature of the facility and its operation
- the maximum number of persons, including workers, likely to be present at the facility on a normal working day.

#### EMERGENCY SITUATIONS

What constitutes an emergency at the facility (i.e. a situation that activates and deactivates the emergency plan) should be clearly defined. 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 facility 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. The following discussions may also assist a facility to define an emergency for its planning purposes.

#### 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 page 16) will provide guidance in determining the level of emergency for a particular type of incident.

Table 1 provides guidance for facilities in 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 sites may only require one level of emergency, while medium to larger scale and more complex facilities could use one, two or more levels of emergency.

### 3. PREPARATION FOR THE EMERGENCY PLAN

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). By comparison, a large release of a corrosive acid that is contained within a bunded area could be classed as a 'local' emergency.

#### **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. Examples of types of emergencies are:

- fire (including the generation of toxic combustion products)
- explosion (including BLEVE)
- spill (of hazardous solids and/or 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, etc.)
- 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 the responsibility of the facility (e.g. off-site pipeline, transport, etc.)
- secondary events or knock-on effects arising within or outside the facility (for example, a flood, a bushfire or an explosion which causes a nearby vessel to fail).

### 3. PREPARATION FOR THE EMERGENCY PLAN

LOCAL	SITE	EXTERNAL
<p>An emergency where the impacts on people, property and the environment:</p> <ul style="list-style-type: none"> <li>are expected to be confined to a specific location within the facility and no escalation is expected</li> </ul>	<p>An emergency where the impacts on people, property and the environment:</p> <ul style="list-style-type: none"> <li>are expected to spread to or affect all parts of the facility, but not off-site</li> </ul>	<p>An emergency where the impacts on people, property and the environment:</p> <ul style="list-style-type: none"> <li>are expected to impact both within the facility and beyond the boundary of the facility</li> </ul>
<p><b>Emergency Services</b> <b>MAY BE REQUIRED</b></p>	<p><b>Emergency Services</b> <b>SHOULD BE REQUIRED</b></p>	<p><b>Emergency Services</b> <b>WILL BE REQUIRED</b></p>
<p>Examples:</p> <ul style="list-style-type: none"> <li>ruptured drum in warehouse</li> <li>leaking flange or seal</li> <li>small fire in a bag store</li> </ul>	<p>Examples:</p> <ul style="list-style-type: none"> <li>tank or bund fire</li> <li>pipe rupture</li> </ul>	<p>Examples:</p> <ul style="list-style-type: none"> <li>a bomb threat</li> <li>large tank bund fire</li> <li>BLEVE of large liquefied gas storage</li> <li>toxic gas release</li> <li>transport incident</li> </ul>

**Table 1: Examples of levels of emergency**

#### DEFINING THE HAZARDS AND THEIR POTENTIAL IMPACTS

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

#### Hazard identification

The emergency planning process should identify all hazards that 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 and electrical)
- natural hazards (e.g. floods, lightning strike, etc.) that could impact upon the safe operation of the facility.

The hazard identification and safety assessment activities should have identified all major incidents and major incident hazards. This list should be supplemented by other risk assessments relating to non-Schedule 15 chemicals that may require an emergency response.

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.



### 3. PREPARATION FOR THE EMERGENCY PLAN

One method of achieving this is to:

- 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
- 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 (e.g. 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.

#### **Hazard analysis**

The hazard identification exercise may reveal a whole spectrum of incidents that 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 (e.g. 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
- 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, increasing the understanding of how an event may unfold and identifying any vulnerable plant and infrastructure requiring protection. There are many modelling tools available for estimating this information, both qualitative and quantitative, and ranging from simple hand calculation techniques to sophisticated computer models. Some estimate of consequence is required in any safety assessment conducted by a MHF and may have also been required for land use planning purposes. The opportunity should be taken to use this information in planning for emergencies. An estimate of the likelihood of an event may further assist in prioritising detailed emergency planning efforts.

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. The facility should be aware of any potential long-term impacts and consequent liability.

### 3. PREPARATION FOR THE EMERGENCY PLAN

#### **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. 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, for example off-site pipelines supplying raw materials to the facility and product from the facility
- the area beyond the boundary of the facility which is likely to be affected in the event of an emergency. This area, called the surrounding area in the WHS Regulations, and often referred to as the community information area by emergency services, will be determined by the hazard analysis.

It is important to identify significant community and environmental features surrounding the facility. 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)
- natural buffers, wildlife corridors, State forests/national parks.

#### **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 above. The total number of people possibly affected should be estimated. The significance of their exposures can be estimated in the hazard identification process. Groups of people to be identified may include:

- employees
- other workers
- visitors
- emergency responders
- people occupying sensitive land use sites who may be more vulnerable to the consequences of an emergency
- 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. PREPARATION FOR THE EMERGENCY PLAN

#### **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 timeframes. 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 (e.g. gas, electricity, water and telecommunications, and emergency services such as fire fighting water and emergency generators)
- overlap between the facility emergency control centre and an inappropriate hazard zone
- adverse weather conditions
- inaccessible or inoperable emergency equipment, isolation equipment and/or safety critical equipment.

#### 3.5 Defining the emergency management system

The next stage is to define an emergency management system that 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.

#### **DESIGNING AND CONSTRUCTING THE EMERGENCY MANAGEMENT SYSTEM**

The design process should 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
- 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 defined short timeframe 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 emergencies with potential for environmental impact, 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
- the potential for further problems arising from the properties of the hazardous materials e.g. ignition sources for flammable gases and vapours.

### 3. PREPARATION FOR THE EMERGENCY PLAN

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.

#### **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 people 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 people on-site
- protecting the environment
- alerting people to the emergency and communicating adequately with all stakeholders during the emergency
- assisting emergency services and nearby facilities with control actions taken in the surrounding area
- accessing the right information
- 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 people on-site may be addressed by functions relating to search and rescue, roll call and safeguarding measures such as evacuation. See Section 4.8 *Emergency functions and organisational structure* for a further explanation of emergency functions and organisation.

Positions should be established and people 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 workers, the Police, Fire and other emergency services. Overall responsibility for these functions would typically be assumed by the facility emergency controller who is supported by the personnel allocated to carry out the various functions.

#### **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 people in performing tasks, particularly while under extreme stress.

### 3. PREPARATION FOR THE EMERGENCY PLAN

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 of emergency) or those specific to the types of incidents identified.

Clause 1.8 of Schedule 16 requires the emergency response procedures to be included in a MHF's emergency plan. These may include:

- procedures for the safe evacuation of, and accounting for, all people on site
- procedures and control points for utilities, including gas, water and electricity
- procedures for the control of any incident involving Schedule 15 chemicals
- procedures for decontamination following an incident involving Schedule 15 chemicals.

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

- raising the alarm
- activating the emergency plan
- notifying the emergency services
- terminating the emergency
- 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.

#### **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). Clause 1.7 of Schedule 16 requires that the emergency plan include the protective resources available to control an incident. Availability of external resources should also be considered.

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 ease of use
- the adequacy of estimations of quantities
- 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).

#### **INFORMATION, KNOWLEDGE AND SKILLS**

##### **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
- emergency contacts.

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

##### **Developing knowledge and skills**

The emergency management system must 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 people to achieve these levels.

In addition, all personnel, whether or not they hold a position in the emergency organisational structure, must 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.

The 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.

#### **COMMISSIONING THE EMERGENCY MANAGEMENT SYSTEM**

The commissioning of a system is the process of ensuring that the system functions effectively according to the intentions of design and implementation. Effective commissioning of the emergency management 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.) that 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 relevant parts of the facility
- the facility emergency controller, emergency organisation personnel and facility emergency responders are suitably identified and appropriately trained
- the plan satisfies the expectations of stakeholders
- the plan can be updated easily and the information communicated as appropriate
- the information of the quantities, locations and 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 authorities.

Once this process has been completed, the system should be managed as described in Section 4.14.

#### **Management of the emergency plan**

Regulation 557(6) requires an operator of an MHF to test the emergency plan, in accordance with the recommendations made by the emergency service organisations consulted in preparing the plan, before applying for a licence for the MHF.

### 3.6 Monitoring and review

The facility establish and maintain policies and procedures to monitor and review the suitability and effectiveness of all phases of the emergency 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 of elements of the plan, emergency 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.

The emergency plan must be tested in accordance with the recommendations made by the emergency service organisations consulted in preparing the plan. That consultation includes the manner in which the plan will be tested, the frequency of testing and whether or not the emergency service organisation will participate in the testing.



# 4. WRITING THE EMERGENCY PLAN

## 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 and Fire services, etc.

This section outlines a general format for an emergency plan and discusses matters that should be considered when writing it. Since the plan is to be tailored to suit the facility, the format may be varied accordingly. Suggested components of the plan are set out in the following paragraphs. Points raised for consideration are not exhaustive.

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

Emergency plans must include at least the matters specified in Schedule 16 of the Regulations.

The MHF operator must keep a copy of the plan at the facility and provide a copy of the plan to the emergency services with whom the plan was prepared and any other relevant emergency services.

## 4.2 Plan title and authority

The plan should clearly identify:

- the name of the facility and the operator or occupier
- the identity, scope and status of the emergency plan
- the location of the facility
- preparation details, including the date of preparation and other terms of reference
- authorisation details (person(s) responsible)
- contact details
- document control information.

## 4.3 Table of contents

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

## 4.4 Aim and objectives of the plan

The aim(s) and objectives of the plan should be clearly stated at the outset. Care needs to be taken that the body of the plan is consistent with this statement.

## 4.5 Introduction

### **FACILITY DESCRIPTION**

The MHF emergency plan must include a brief description of the facility and its operation. Other required background information includes:

- the location of the facility
- a detailed map (see Appendix D)
- an inventory of all hazardous chemicals on site and their location (see Appendix E).

For large or complex facilities, it may be preferable to simply put a summary in the introductory section and provide details in an appendix.

### **DEFINITION OF AN EMERGENCY**

The introductory section of the plan should also contain a definition of the situations that constitute an emergency for the facility (see Section 3.5) and an outline of the levels of emergencies identified. Other assumptions underpinning the plan should also be stated (Section 3.5).

## 4.6 Hazards

Details should be provided of the hazards identified as having a significant impact. This should cover hazardous materials and other hazards.

### **DETAILS OF HAZARDOUS MATERIALS**

Details of all hazardous materials in significant quantities under the control of the facility, including hazardous intermediates, must 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
- other hazardous materials, such as poisons, workplace hazardous substances, combustible liquids, carcinogens, environmentally hazardous materials, etc.

Details of hazardous materials should include the following:

- a 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)
- the location of tanks or package stores (keyed to the site layout plan)
- the location of additional relevant safety, health and environmental information
- a description of safety-critical equipment, especially equipment used for the isolation and/or containment of a release.

### 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.

### 4.7 Types and levels of emergency

The types and levels of possible emergencies identified for the facility should be described (refer to Section 3.5 and following).

### 4.8 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. The specific manner of translating areas of responsibilities into functions will depend on the size and the resources of a facility.

The Regulations require that the emergency plan provide the following details of command structure and personnel:

- the command philosophy and structure to be activated in an emergency, so that it is clear what actions will be taken, who will take these actions, and how, when and where they will be taken (see *Emergency functions*)
- details of the person who can clarify the content of the emergency plan if necessary
- the contact details of, and the means of contacting, the persons at the facility responsible for liaising with emergency services (see page 33)
- a list of 24-hour emergency contacts (see page 33)
- arrangements for assisting emergency services and nearby facilities with control actions taken in the surrounding area (see *Emergency functions*).

### ROLES OF AGENCIES, GROUPS, INDUSTRY AND THE COMMUNITY

The roles, responsibilities, functions and needs of all key stakeholders (e.g. industry, the community, and external agencies such as the Police and Fire services) should be clearly identified. 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.

### 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
- 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.

### 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 AS 3745 - *Emergency control organisation and procedures for buildings, structures and workplaces*) and distinctive tabards identifying the facility and the emergency position or function may be used.

## 4.9 Emergency procedures

Specific emergency procedures are an important part of the overall emergency management system. 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. Operators of MHFs are required to develop procedures for the control of any incident involving Schedule 15 chemicals (Clause 5.3 of Schedule 16).

The emergency response flowchart in 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. 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/evacuate the immediate area
- use of appropriate protective equipment
- isolate the source of release
- contain the spill
- use of absorbents
- waste control and disposal.

### 4.10 Emergency resources

The resources (equipment and amenities) provided to respond to emergencies should be identified and details provided as discussed in Section 3.6. The emergency plan must include:

- on-site emergency resources, including emergency equipment, personnel, gas detectors, wind velocity detectors, sand, lime, neutralising agents, absorbents, spill bins and decontamination equipment
- off-site emergency resources, including arrangements for obtaining additional external resources (specific to the likely major incidents) to assist the control of major incidents and major incident hazards.

#### **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 appropriately resourced with communications equipment and essential documents, including the emergency plan, emergency procedures, SDS and other relevant safety information. Location maps and site layout plans, as well as information relating to the relevant hazards and emergency equipment available, should be available in the FECC and 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.

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

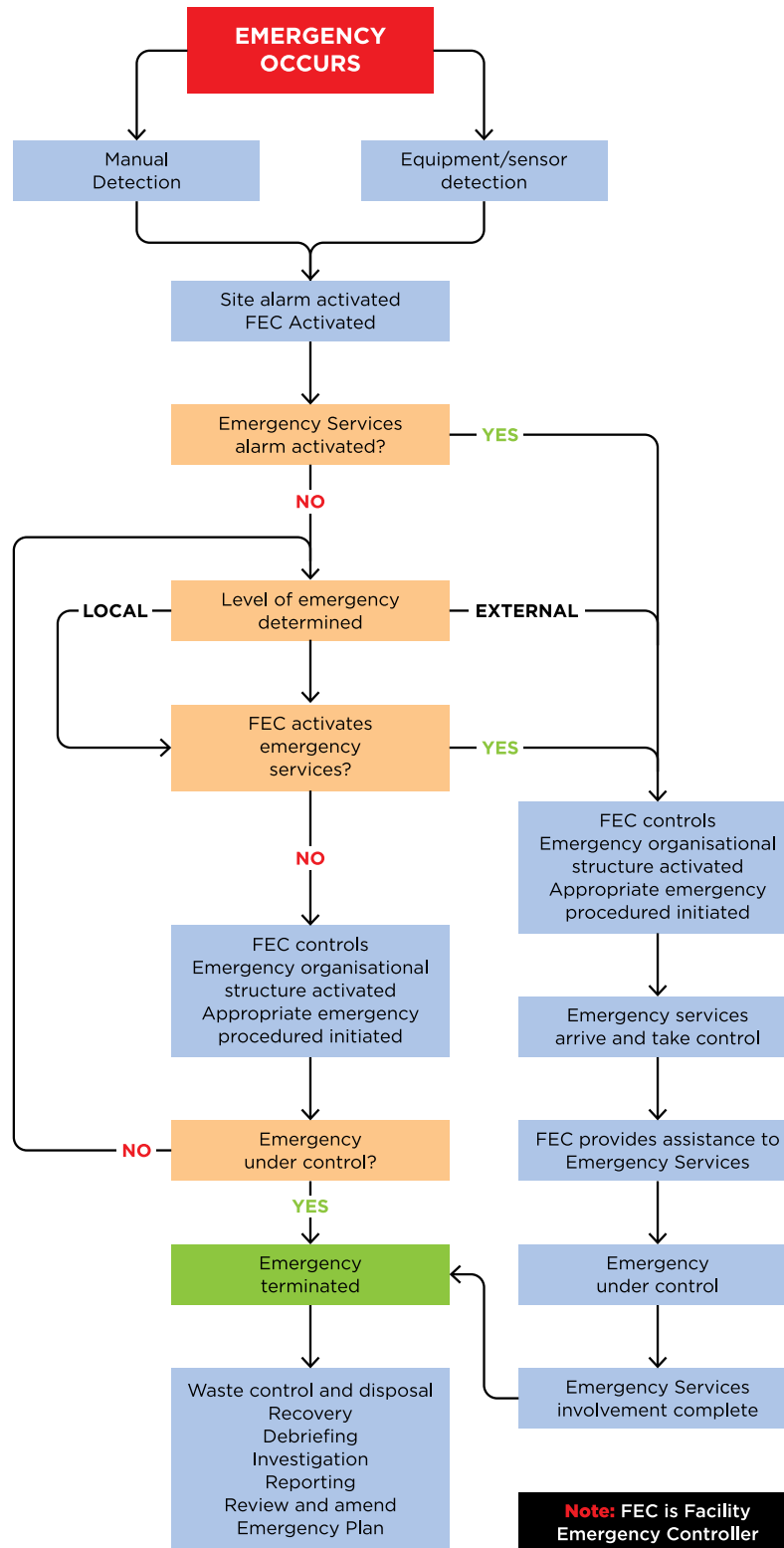


Figure 3: Emergency response flowchart

### **EMERGENCY ALARM SYSTEM**

The facility should have an effective alarm and warning system for all levels of emergency. The emergency plan must include both off-site and on-site warning systems. 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 and warning devices
- 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
- alarm operations if the facility is not staffed.

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

### **4.11 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)
- the means of addressing communication issues with the relevant emergency services and other stakeholders.

### INITIAL ADVICE TO THE EMERGENCY SERVICES

The role, responsibilities and duties of the person nominated to advise the emergency services of the emergency should be identified. The nature of the initial advice and the information required should be determined following consultation with the Police, Fire and other emergency services. The advice would usually be given by dialling 000 and asking for the relevant emergency service agency (typically Fire).

The information provided 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 and quantities involved)
- telephone contact number (for any return messages)
- name of person making the call
- any other useful information (e.g. wind speed and wind direction).

The MHF operator must immediately notify the emergency services consulted in preparing the plan of the occurrence of specified incidents.

### EMERGENCIES WITH POTENTIAL FOR ENVIRONMENTAL IMPACT

The role, responsibilities and duties of the person nominated to notify the relevant agencies of an emergency with potential for environmental impact should be identified. The method of notification (e.g. telephone), the timing of notification (e.g. during or after the emergency) 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 environmental protection agency
- the local authority
- the relevant port authority.

### 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 organisation and procedures for buildings, structures and workplaces* and AS 4083 - *Planning for emergencies - Health care facilities*.

## 4.12 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.



### 4.13 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
- the declaration by the facility emergency controller that the emergency has been terminated.

### 4.14 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 on pages 33.

### 4.15 Supporting information

Information supporting the plan and essential for the emergency services needs 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 environmental information (page 32)
- the location map (see Appendix D)
- the site layout plan (see Appendix E)
- a list of emergency contact phone numbers (see page 33)
- other relevant supporting information (see page 34).

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.

#### **SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION**

The plan should identify the locations of, and allow for access to, relevant work health and safety and environmental information to assist with managing the emergency. This may include copies of SDS, 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), which should be marked on the site plan.

### LOCATION MAPS

Location maps must be provided, detailing significant facility and local community features (see Appendix D for a simple example of a location map). The location map(s) should include the:

- 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 use(s) (for example, residential, industrial, commercial, vacant, bushland, etc.)
- places of possible concentrations of people (for example, sports grounds, shopping centres, etc.)
- places of special interest in an emergency (for example, major infrastructure, hospitals, child care facilities, schools, nursing homes, etc.)
- site topography (including slope of land, nearby watercourses and environmentally sensitive sites, drainage systems including access points, etc.).

Note that Clause 1.2 of Schedule 16 sets out the minimum information that must be included on the map.

### 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

## 4. WRITING THE EMERGENCY PLAN

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

See Appendix E for a simple example of a site layout plan.

### **EMERGENCY CONTACT NUMBERS**

An easily accessible list of current emergency contact numbers must be provided, which may include:

- off-site emergency numbers
- facility numbers
- key facility personnel details (including job title, local extension and after-hours numbers)
- control rooms or distribution points
- contact details of, and the means of contacting, the persons at the facility responsible for liaising with emergency services
- other 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
- media liaison organisations.

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

### 4.16 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

To remain a living document, the emergency plan must be properly supported and managed. It should be incorporated into the SMS to ensure its continued effectiveness. The safety management 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).

## 5.1 Training and education

All persons on-site, including visitors and contractors, should be provided with induction, education and ongoing training to ensure they have a general awareness of the emergency plan and the capability to undertake their roles and responsibilities in the event of an emergency.

Regulations 571 and 572 specify information that must be provided to visitors and the local community. 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
- 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 local community surrounding area must be provided with information on the appropriate actions to be taken during an emergency and the means by which they will be warned of, and kept informed during, an emergency. Also see the discussion on consultation in Section 3.2.

## 5.2 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 ongoing training and education
- ensuring that the plan is updated as required
- ensuring that the appropriate information is communicated to all stakeholders, including the community and the local emergency services.

Continued communication with the local 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.

### 5.3 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)
- new staff are issued with emergency protective equipment.

### 5.4 Record keeping

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

Circumstances for which records should be kept include:

- all induction programs and ongoing training, including details of personnel trained
- desktop 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
- management reviews.

### 5.5 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.

### 5.6 Investigation following 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:

## 5. MANAGEMENT OF THE EMERGENCY PLAN

- official investigations (e.g. by the Police, Fire Services, Regulator 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
- 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
  - all available data useful for assessing possible long-term impacts on facility personnel, the community and the environment.

### 5.7 Exercises and testing of the plan

The operator must test the emergency plan before applying for a licence for the MHF. 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. The operator must consult with the relevant emergency services organisation on testing of the emergency procedures, including frequency of testing.

### 5.8 Implementation of the plan

The operator must immediately implement the emergency plan if:

- a major incident occurs in the course of the operation of the MHF
- an event occurs that could reasonably be expected to lead to a major incident.

### 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:

- changes in legislation
- advances in technology and equipment
- changes in organisational direction
- changes in products and activities
- lessons from incidents
- 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. **The verification code for this document is 860289**

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

Regulation 569 requires a review and, if necessary, update of the plan when:

- a health and safety representative or regulator requests a review
- at least once every five years

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 incidents 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 A – WHS REGULATIONS

Regulation	Requirement
43	<p><b>Duty to prepare, maintain and implement emergency plan</b></p> <p>(1) A person conducting a business or undertaking at a workplace must ensure that an emergency plan is prepared for the workplace, that provides for the following:</p> <ul style="list-style-type: none"> <li>(a) emergency procedures, including:           <ul style="list-style-type: none"> <li>(i) an effective response to an emergency; and</li> <li>(ii) evacuation procedures; and</li> <li>(iii) notifying emergency service organisations at the earliest opportunity; and</li> <li>(iv) medical treatment and assistance; and</li> <li>(v) effective communication between the person authorised by the person conducting the business or undertaking to coordinate the emergency response and all persons at the workplace;</li> </ul> </li> <li>(b) testing of the emergency procedures, including the frequency of testing;</li> <li>(c) information, training and instruction to relevant workers in relation to implementing the emergency procedures.</li> </ul> <p>(2) A person conducting a business or undertaking at a workplace must maintain the emergency plan for the workplace so that it remains effective.</p> <p>(3) For the purposes of subregulations (1) and (2), the person conducting the business or undertaking must consider all relevant matters including:</p> <ul style="list-style-type: none"> <li>(a) the nature of the work being carried out at the workplace; and</li> <li>(b) the nature of the hazards at the workplace; and</li> <li>(c) the size and location of the workplace; and</li> <li>(d) the number and composition of the workers and other persons at the workplace.</li> </ul> <p>(4) A person conducting a business or undertaking at a workplace must implement the emergency plan for the workplace in the event of an emergency.</p>
361	<p><b>Emergency plans</b></p> <p>(1) This regulation applies if the quantity of a Schedule 11 hazardous chemical used, handled, generated or stored at a workplace exceeds the manifest quantity for that hazardous chemical.</p> <p>(2) A person conducting a business or undertaking at the workplace must give a copy of the emergency plan prepared under Division 4 of Part 3.2 for the workplace to the primary emergency service organisation.</p> <p>(3) If the primary emergency service organisation gives the person a written recommendation about the content or effectiveness of the emergency plan, the person must revise the plan in accordance with the recommendation.</p>

Regulation	Requirement
551	<p><b>Safety case outline must be provided</b></p> <p>The operator of a determined major hazard facility must provide the regulator with a safety case outline for the major hazard facility within 3 months after the facility is determined to be a major hazard facility.</p>
552	<p><b>Content</b></p> <p>A safety case outline provided under regulation 551 must include the following:</p> <p>(e) a draft of the emergency plan prepared or to be prepared under regulation 557;</p>
557	<p><b>Emergency plan</b></p> <p>(1) The operator of a determined major hazard facility must prepare an emergency plan for the major hazard facility that:</p> <ul style="list-style-type: none"> <li>(a) addresses all health and safety consequences of a major incident occurring; and</li> <li>(b) includes all matters specified in Schedule 16; and</li> <li>(c) provides for testing of emergency procedures, including the frequency of testing.</li> </ul> <p>(2) In preparing an emergency plan, the operator must consult with:</p> <ul style="list-style-type: none"> <li>(a) the emergency service organisations with responsibility for the area in which the major hazard facility is located; and</li> <li>(b) in relation to the off-site health and safety consequences of a major incident occurring—the local authority.</li> </ul> <p>(3) The operator must ensure that the emergency plan addresses any recommendation made by the emergency service organisations consulted under subregulation (2) in relation to:</p> <ul style="list-style-type: none"> <li>(a) the testing of the emergency plan, including the manner in which it will be tested, the frequency of testing and whether or not the emergency service organisations will participate in the testing;</li> <li>(b) what incidents or events at the major hazard facility should be notified to the emergency service organisations.</li> </ul> <p>(4) The operator must have regard to any other recommendation or advice given by a person consulted under subregulation (2).</p> <p>(5) The operator must:</p> <ul style="list-style-type: none"> <li>(a) keep a copy of the plan at the major hazard facility; and</li> <li>(b) provide a copy of the plan to: <ul style="list-style-type: none"> <li>(i) the emergency service organisations consulted under subregulation (2); and</li> <li>(ii) any other relevant emergency service organisations.</li> </ul> </li> </ul>

Regulation	Requirement
557	<p>6) The operator must test the emergency plan in accordance with the recommendations made by the emergency service organisations consulted under subregulation (2) before applying for a licence for the major hazard facility.</p> <p>(7) The operator must immediately implement the emergency plan if:</p> <ul style="list-style-type: none"> <li>(a) a major incident occurs in the course of the operation of the major hazard facility; or</li> <li>(b) an event occurs that could reasonably be expected to lead to a major incident.</li> </ul> <p>(8) The operator must notify the emergency service organisations consulted under subregulation (2) of the occurrence of an incident or event referred to in subregulation (3)(b).</p>
559	<p><b>Review of risk management</b></p> <p>(1) The operator of a determined major hazard facility must review and as necessary revise each of the following, in accordance with this regulation:</p> <ul style="list-style-type: none"> <li>(b) the major hazard facility’s emergency plan;</li> </ul> <p>(2) Without limiting subregulation (1), the operator must conduct a review and revision in each of the following circumstances:</p> <ul style="list-style-type: none"> <li>(a) a modification to the major hazard facility is proposed;</li> <li>(b) a control measure implemented under regulation 556 does not minimise the relevant risk so far as is reasonably practicable;</li> </ul> <p><b>Example</b></p> <p>An effectiveness test indicates a deficiency in the control measure.</p> <ul style="list-style-type: none"> <li>(c) a new major hazard risk is identified;</li> <li>(d) the results of consultation by the operator under Part 9.5 indicate that a review is necessary;</li> <li>(e) a health and safety representative requests the review;</li> <li>(f) the regulator requires the review.</li> </ul> <p>(3) In reviewing and revising the emergency plan, the operator must consult with the emergency service organisations referred to in regulation 557(2).</p> <p>(4) For the purposes of subregulation (2)(e), a health and safety representative at a workplace may request a review if the representative reasonably believes that:</p> <ul style="list-style-type: none"> <li>(a) a circumstance referred to in subregulation (2)(a), (b), (c) or (d) affects or may affect the health and safety of a member of the work group represented by the health and safety representative; and</li> <li>(b) the operator has not adequately conducted a review in response to the circumstance.</li> </ul>

Regulation	Requirement
567	<p><b>Emergency plan</b></p> <p>(1) The operator of a licensed major hazard facility must keep a copy of the major hazard facility’s emergency plan prepared under regulation 557 as revised under Part 9.3 and this Part at the facility.</p> <p>(2) The operator must test the emergency plan in accordance with the recommendations made by the emergency service organisations referred to in regulation 557(2).</p> <p>(3) The operator must immediately implement the emergency plan if:</p> <ul style="list-style-type: none"> <li>(a) a major incident occurs in the course of the operation of the major hazard facility; or</li> <li>(b) an event occurs that could reasonably be expected to lead to a major incident.</li> </ul> <p>(4) The operator must notify the regulator and the emergency service organisations referred to in regulation 557(2) of the occurrence of an incident or event referred to in regulation 557(3) as soon as practicable after the incident or event occurs.</p>
569	<p><b>Review of risk management</b></p> <p>(1) The operator of a licensed major hazard facility must review and as necessary revise the following, in accordance with this regulation:</p> <ul style="list-style-type: none"> <li>(b) the major hazard facility’s emergency plan;</li> </ul> <p>(2) Without limiting subregulation (1), the operator must conduct a review and revision in each of the following circumstances:</p> <ul style="list-style-type: none"> <li>(a) a modification to the major hazard facility is proposed;</li> <li>(b) a control measure implemented under regulation 566 does not minimise the relevant risk so far as is reasonably practicable;</li> </ul> <p><b>Example</b></p> <p>An effectiveness test indicates a deficiency in the control measure.</p> <ul style="list-style-type: none"> <li>(c) a new major hazard risk is identified;</li> <li>(d) the results of consultation by the operator under Part 9.5 indicate that a review is necessary;</li> <li>(e) a health and safety representative requests the review;</li> <li>(f) the regulator requires the review;</li> <li>(g) at least once every 5 years.</li> </ul>
572	<p><b>Information for local community—general</b></p> <p>(1) The operator of a licensed major hazard facility must ensure the provision of the following information to the local community and the local authority:</p> <ul style="list-style-type: none"> <li>(e) the actions, as specified in the major hazard facility’s emergency plan, that members of the local community should take if a major incident occurs;</li> </ul>

Regulation	Requirement
575	<p><b>Operator of major hazard facility must consult with workers</b></p> <p>(1) For the purposes of section 49(f) of the Act, the operator of a determined major hazard facility must consult with workers at the major hazard facility in relation to the following:</p> <p>(b) the preparation, testing and implementation of the major hazard facility’s emergency plan;</p>
Schedule 16	<p><b>Matters to be included in emergency plan for major hazard facility</b></p> <p><b>1 Site and hazard detail</b></p> <p>1.1 The location of the facility, including its street address and the nearest intersection (if any).</p> <p><b>Note</b></p> <p>Sufficient detail must be provided to enable a person not familiar with the site to find it. 1.2 A map:</p> <p>(a) showing the site of the major hazard facility; and</p> <p>(b) showing land use and occupancy in the surrounding area, and any other closely located major hazard facilities and hazardous chemical storage sites; and</p> <p>(c) identifying all potentially hazardous inventories in the area that are known to the operator and the location of all staging points for emergency services.</p> <p>1.3 An inventory of all hazardous chemicals present or likely to be present at the facility, and their location.</p> <p>1.4 A brief description of the nature of the facility and its operation.</p> <p>1.5 The maximum number of persons, including workers, likely to be present at the facility on a normal working day.</p> <p>1.6 The emergency planning assumptions, including emergency measures planned for identified incidents and likely areas affected.</p> <p>1.7 The protective resources available to control an incident.</p> <p>1.8 The emergency response procedures.</p> <p>1.9 The infrastructure (on-site and off-site) likely to be affected by a major incident.</p> <p><b>2 Command structure and site personnel</b></p> <p>2.1 The command philosophy and structure to be activated in an emergency, so that it is clear what actions will be taken, who will take these actions and how, when and where they will be taken.</p> <p>2.2 Details of the person who can clarify the content of the emergency plan if necessary.</p>

Regulation	Requirement
	<p>2.3 The contact details of, and the means of contacting, the persons at the facility responsible for liaising with emergency services.</p> <p>2.4 A list of 24 hour emergency contacts.</p> <p>2.5 Arrangements for assisting emergency services and nearby facilities with control actions taken in the surrounding area.</p> <p><b>3 Notifications</b></p> <p>3.1 In the event of the occurrence of a major incident or an event that could reasonably be expected to lead to a major incident, procedures for notifying the emergency services with which the emergency plan was prepared under regulation 567.</p> <p>3.2 After a major incident has occurred, procedures for providing the local community and the local authority for the local authority area in which the facility and the surrounding area are located with information about the major incident under regulation 573.</p> <p>3.3 On-site and off-site warning systems.</p> <p>3.4 Contact details for emergency services and other support services that can assist in providing resources and implementing evacuation plans in the event of a major incident.</p> <p>3.5 On-site communication systems.</p> <p><b>4 Resources and equipment</b></p> <p>4.1 On-site emergency resources, including emergency equipment, personnel, gas detectors, wind velocity detectors, sand, lime, neutralising agents, absorbents, spill bins and decontamination equipment.</p> <p>4.2 Off-site emergency resources, including arrangements for obtaining additional external resources (specific to the likely major incidents) to assist the control of major incidents and major incident hazards.</p> <p><b>5 Procedures</b></p> <p>5.1 Procedures for the safe evacuation of, and accounting for, all people on site.</p> <p>5.2 Procedures and control points for utilities, including gas, water and electricity.</p> <p>5.3 Procedures for the control of any incident involving Schedule 15 chemicals.</p> <p>5.4 Procedures for decontamination following an incident involving Schedule 15 chemicals.</p>

## APPENDIX B – DEFINITIONS

**BLEVE** is an acronym for Boiling Liquid Expanding Vapour Explosion, which arises from 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** is the Chemical Abstracts Service Number (from American Chemical Society) used to identify specific chemicals.

**Community information area** is a term often used by emergency services to describe the area beyond the boundary of a facility which is likely to be affected in the event of an emergency (see “surrounding area”).

**Consequence** is 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** means an incident at a major hazard facility requiring activation of the emergency plan.

**Environmental receptors** are the various components of the surrounding environment, including air, water systems, land, flora and fauna, that may suffer a deleterious impact from a contaminant.

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

**Facility** means a workplace at which Schedule 15 chemicals are present or likely to be present.

**Facility emergency control centre (FECC)** is 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.

**Facility emergency controller (FEC)** is the person in charge of managing an emergency for the facility and has overall responsibility for all functions performed by facility personnel during an emergency.

**Hazard** means a situation or an intrinsic property with the potential to cause harm to people, property, or the built or natural environment.

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

**Hazardous material(s)** means 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** is the emergency action code associated with dangerous goods.

**Impact** means 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)** means a deviation from the intended operating conditions at a hazardous facility that has the potential to result in an emergency (e.g. hole in pipe work or vessel, runaway reaction, overfilling of pressure vessel).

**Knock-on effects** means 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.

**Local authority**, in relation to a facility, means the local authority for the local authority area in which the facility and the surrounding area are located.

**Major hazard facility (MHF)** means a facility:

- at which Schedule 15 chemicals are present or likely to be present in a quantity that exceeds their threshold quantity
- that is determined by the regulator under Part 9.2 to be a major hazard facility.

**Major incident** at a major hazard facility is an occurrence that:

- results from an uncontrolled event at the major hazard facility involving, or potentially involving, Schedule 15 chemicals
- exposes a person to a serious risk to health and safety emanating from an immediate or imminent exposure to the occurrence.

An **occurrence** includes any of the following

- escape, spillage or leakage
- implosion, explosion or fire.

**Major incident hazard** means a hazard that could cause, or contribute to causing, a major incident.

**Manifest** means a written summary of the hazardous chemicals used, handled or stored at a workplace, compliant with Schedule 12 of the regulations.

#### **Operator**

- in relation to a facility, means the person conducting the business or undertaking of operating the facility, who has:
  - management or control of the facility
  - the power to direct that the whole facility be shut down
- in relation to a proposed facility, means
  - the operator of a proposed facility that is an existing workplace
  - the person who is to be the operator of a proposed facility that is being designed or constructed.

**Overpressure** means the pressure developed above atmospheric pressure at any stage or location from a blast wave or pressure.

**Risk** is the likelihood of a specific level of harm occurring from a hazard.

**Risk assessment** involves considering what could happen if someone is exposed to a hazard and the likelihood of it happening.



**Safety assessment** is the process by which the operator of a major hazard facility systematically and comprehensively investigates and analyses all aspects of risks to health and safety associated with all major incidents that could occur in the course of the operation of the major hazard facility.

**Safety management system (SMS)** as set out in the Regulations (558 and 568) and Schedule 17 means the comprehensive integrated system for managing all aspects of risk control in relation to the possible occurrence of major incidents at a major hazard facility and is used by the operator as the primary means of ensuring safe operation of the MHF.

**Schedule 15 chemical** means a hazardous chemical that:

- is specified in Schedule 15, table 15.1 of the WHS Regulations
- belongs to a class, type or category of hazardous chemicals specified in Schedule 15, table 15.2 of the Regulations.

**Sensitive environmental receptor** means an environmental receptor that is likely to suffer a deleterious impact from a contaminant.

**Sensitive land use** means 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.

**Surrounding area**, in relation to a facility, means the area surrounding the facility in which the health and safety of persons could potentially be adversely affected by a major incident occurring.

**Tabard** is a short tunic, open at the sides, with identifying markings.

**Threshold quantity**, in relation to a Schedule 15 chemical, means:

- the threshold quantity of a specific hazardous chemical as determined under clause 3 of Schedule 15
- the aggregate threshold quantity of 2 or more hazardous chemicals as determined under clause 4 of Schedule 15 (regulation 5).

**United Nations Number (UN No.)**, in relation to dangerous goods, 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.

# APPENDIX C – 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 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
- 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 that 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 that cannot be immediately shut down safely.

Specific activities may include:

- a staged shut-down over a period of time
- 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 health and safety. 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 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
- 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 Services and for the provision of information that 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 relevant ambulance or other 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 workers 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 relevant environment agencies 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)
- liaising with environmental protection agencies during the response and recovery phases of an emergency.

## 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
- 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, 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 services media liaison staff, the incident coordinator and the incident commander. Consideration should also be given to the timing of the release of information to facility personnel. Topics for consideration might include:

- liaison with Police and Fire services media staff before the release of any information to the media
- the possible need to also liaise with 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/organisations after the incident
- the process of community liaison after the incident.

## APPENDIX D – EXAMPLE LOCATION MAP

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

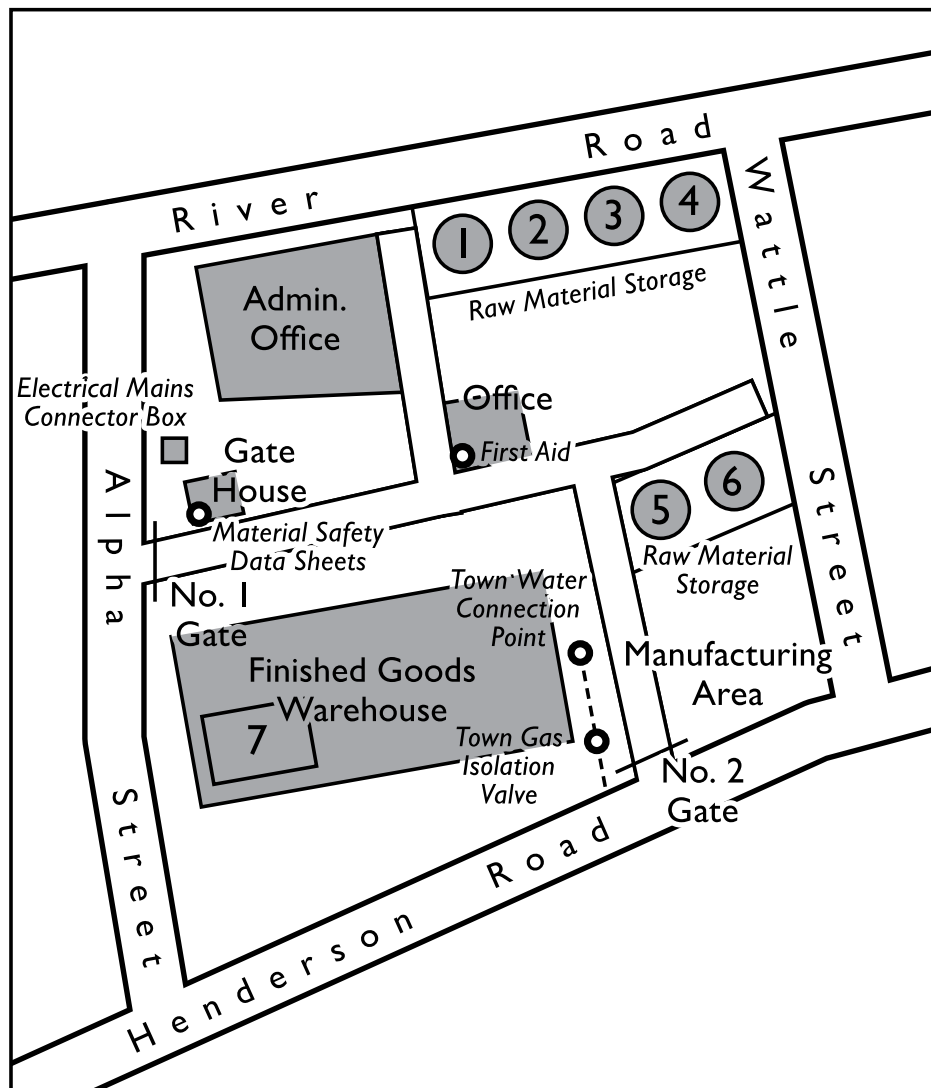
As an example, the following map shows the approximate area covered by the NSW Department of Planning & Infrastructure's Kurnell Land Use Safety Study, as shown by the dashed lines. Further details of items that should be shown on the map are given on page 31. Note that Clause 1.2 of Schedule 16 sets out the minimum information that must be included on the map. Not all details are shown in this example.



**Figure 4:** Example location map

# APPENDIX E – SAMPLE SITE LAYOUT DIAGRAM

Further details of items that should be included are provided on page 31.



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

**Figure 5:** Sample site layout diagram



## APPENDIX F – FURTHER INFORMATION

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

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

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

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

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

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

National Road Transport Commission (2003) *Guidelines for the Preparation of a Transport Emergency Response Plan* - ISBN 0 642 45037 4. <http://www.ntc.gov.au/filemedia/Reforms/GuidelineERP.pdf>

NSW Department of Planning & Infrastructure, 2011, *Hazardous Industry Planning Advisory Paper No. 1: Emergency Planning*.

