Government of **Western Australia**
Department of **Mines, Industry Regulation and Safety**

Major hazard facility – guide

Development and submission of a safety report

as required under
Dangerous Goods Safety Act 2004
Dangerous Goods Safety (Major Hazard Facilities) Regulations 2007

May 2020

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Guides

A guide is an explanatory document that provides information on the requirements of legislation, details good practice and may explain means of compliance with standards prescribed in the legislation. The government, unions or employer groups may issue guidance material.

Compliance with guides is not mandatory. However, a guide could have legal standing if it were demonstrated that the guide is the industry norm.

This Guide has an operations focus and is set out in the context of risk assessment and legislative requirements of all responsible persons. Consequently, each operation needs to understand its limitations and skills base.

The Guide is based on current experience and is not claimed to be complete.

Who should use this Guide?

You should use this Guide if:

- you are the operator of a classified major hazard facility licensed under the *Dangerous Goods Safety Act 2004*

- you are required to develop and maintain a safety report under the Dangerous Goods Safety (Major Hazard Facility) Regulations 2007.

The Act

The *Dangerous Goods Safety Act 2004* (the Act) sets objectives to licensees for the safe operation of major hazard facilities licensed under the Act that prevents injury or harm to personnel and other protected persons entering the licensed area of the facility.

The Act sets out broad duties, and is supported by regulations together with codes of practice and guides.

Regulations

Dangerous Goods Safety (Major Hazard Facility) Regulations 2007 (the regulations) provide specific requirements for a range of operations.

Dangerous Goods Safety (Storage and Handling of Non-Explosives) Regulations 2007 (DGSH) provide information relating to the storage and handling of dangerous goods and also the management of incidents and hazards.

The regulations are subsidiary legislation enabled by the Act and are enforceable. Breaches may result in prosecution, fines, or directions to cease operations and undertake remedial action.

Application

This Guide is a non-statutory document provided by the Department to assist persons subject to duties under the Act and/or required to develop and/or comply with a safety report as prescribed by the regulations.

Contents

Foreword

The safety report represents the key demonstration by an operator to the government that the operator is aware of the risks associated with their operations and that there is a rigorous system in place to manage those risks. Because of this importance, the effort required by the operator to develop the report and the government to review and approve the report is significant.

Whilst often seen as purely a legislative requirement, the Department views safety reports as somewhat more than that. It contains commitments that the operator has made and hence is to be held to but also forms one of the key tools used by major hazard facility (MHF) operators to improve safety and build a progressive and positive safety culture within their organisation.

Significant MHF incidents and accidents here in Australia, such as the Longford Gas Plant in September 1998, and others around the world, demonstrated the potential catastrophic nature of such occurrences in terms of loss of life and damage to property.

The subsequent Royal Commission conducted in relation to the Longford incident highlighted a lack of understanding by both management and the workforce as one of the root causes of the accident. First and foremost, the safety report is a communication tool to all stakeholders – employees, management and government – about the hazards, risks and their control within the MHF.

Similarly, Lord Cullen stated in 2001 that:

> *"A safety case regime provides a comprehensive framework within which the duty holder's arrangements and procedures for the management of safety can be demonstrated and exercised in a consistent manner. In broad terms, the safety case is a document – meant to be kept up to date – in which the operator sets out its approach to safety and the safety management systems which it undertakes to apply. It is, on the one hand, a tool for internal use in the management of safety and, on the other hand, a point of reference in the scrutiny by an external body of the adequacy of that management of safety – a scrutiny which is considered to be necessary for maintaining confidence on the part of the public."*

Development of safety reports requires specific expertise and knowledge and deals with accident and incident events that, whilst catastrophic, have generally very low probability of occurrence and are extremely rare within the experience of the people doing the analysis. It is easy to miss events or over focus on one hazard type to the expense of other just as important hazards.

A series of guides has been developed to assist operators to meet their commitments under the Western Australian *Dangerous Goods Safety Act 2004* (the Act) and Dangerous Goods Safety (Major Hazard Facility) Regulations 2007 (the regulations) for the development and subsequent management of their safety report. These guides have been based on the experiences of the dangerous goods officers (DGOs) and are an attempt to address common points of confusion and difficulty that have arisen previously, but importantly, these guides cannot cover all situations. They are also show a means of compliance, but are not the only means of compliance. It is emphasised that despite these guides, the best source of information is talking with the DGOs directly. This does not mean that DGOs should be used as de facto consultants – the onus for developing a compliant safety report lies totally with the operator. However, the development of the safety report forms the cornerstone of the relationship between operator and regulator that will last for the lifetime of the operation.

The guides also present both operators and regulator with the opportunity to quickly and easily address areas of uncertainty and confusion that affect all of us.

Steve Emery

Acting Chief Dangerous Goods Officer

May 2020

1   Introduction

This document provides guidance to operators of major hazard facilities (MHF) for the development of safety reports under the Act and the Regulations. This document is not to be read as a step-by-step instruction on the required contents of a safety report, or how to perform a risk assessment or develop a safety management system. It is intended to provide high level guidance on how to achieve the intent and expectations of the Chief Officer [r. 25(2)(d)]. The Chief Officer is a departmental officer designated under the *Dangerous Goods Safety Act 2004* s. 25(2) with the power to administer the Act, including the approval of safety reports.

Each safety report must be submitted to the Chief Officer at the Department of Mines, Industry Regulation and Safety (the Department) for approval.

1.1   Structure and scope

This Guide reflects the four areas of a safety report and provides an overview of the required contents to comply with the Act and the regulations (Section 2.2).

The following appendices are included:

Appendix 1 Legislative provisions

Appendix 2 Glossary of terms

Appendix 3 Concordance table

Appendix 4 Further information

1.2   Safety report content map

In order to assist operators preparing safety report documentation, a content map has been developed to support this guide. It is suggested that the operator include this map in an appendix to the safety report listing the regulations and the section of the introduction, facility description, safety management system (SMS) or risk assessment, which covers the requirements of those regulations.

Operators should complete the content map during the development and internal review of the safety report to verify that:

• sufficient information has been included

• each element of the legislation has been adequately covered.

Where a requirement has been listed that is not applicable to the MHF covered by the safety report, then operators should note this in the content map to indicate that the requirement has been considered and not just overlooked.

In this way, the content map can act as a final check for the operator to assist in avoiding possible delays in the approval of the safety report.

1.3   Classification and scope of a major hazard facility

The operator of an MHF must give notification to the Chief Officer as soon as practicable if more than the critical quantity of Schedule 1 substances is likely to be at the facility [r. 14], and the operator has not been given notice under r. 21(1) of the Chief Officer's decision whether to classify the place as an MHF.

This notification must be in writing, state the relevant date and contain the notifiable information for the place as it exists, or as the operator expects it will exist, on the relevant date [r. 17(2)].

The notification should also include details of the scope of the MHF; that is, include registered dangerous goods pipelines, jetty, dock, pier or conveying system, and non-Schedule 1 dangerous goods.

On receiving the notification from the operator, the Chief Officer must decide whether or not to classify the place as an MHF [r. 19(2)].

The *Dangerous Goods Safety Act 2004* does not apply to pipelines carrying dangerous goods to which the *Gas Standards Act 1972, Petroleum Pipelines Act 1969* or *Petroleum (Submerged Lands) Act 1982* apply [s. 6(1)].

These pipelines should be covered by separate safety documentation as required under the relevant legislation.

1.4 Duties of the operator

1.4.1 Duties under the Act

Under s. 8 of the *Dangerous Goods Safety Act* 2004 (the Act) the operator of an MHF must take all reasonably practicable measures to minimise the risk to people, property and the environment from dangerous goods.

Reasonably practicable measures are achieved by the implementation of the appropriate risk control measures on identified hazards and the subsequent demonstration of so far as reasonably practicable (SFARP). This is covered in section 3.3.6 of this Guide as well as the supporting guide, *ALARP demonstration.*

The approved safety report is considered a safety management document under the Act.

1.4.2 Duties under the regulations

Under the regulations, the operator is required to prepare a safety report for the facility [r. 25(1)] and to operate the facility in accordance with the safety management system (SMS) contained within the safety report [r. 13].

The operator of an MHF must prepare a risk assessment for the facility that:

- identifies all dangerous goods hazards

- assesses the probability of each hazard causing a major incident

- assesses the potential consequences as a result of that major incident

- identifies the risk control measures (safety critical controls) that reduce the risk SFARP

- describes the methods and resources used for the above points.

The operator of a MHF must prepare a SMS for the facility. The SMS must record the policies and procedures used to manage the hazards on site. This must include employee competency, safe operation procedures, maintenance procedures, isolation procedures, alarm management, security procedures and procedures for communicating with people at the facility as stated in sch. 4 of the Regulations as well as any other procedures and processes in place to safely manage the MHF.

1.5 Expectations of the Chief Officer

The Chief Officer expects MHF operators to be able to demonstrate that they adequately meet their duty to minimise the risks from dangerous goods. One of the primary methods to demonstrate compliance, as an operator of an MHF, is through the implementation of a quality safety report. The safety report is as unique as the plant or facility itself and therefore needs to be explicit about the operations and safety measures therein.

In order to meet the expectations of the Chief Officer the safety report needs to:

- be an effective communication tool regarding the safe operation of the facility

- demonstrate that reasonably practical measures are in place to minimise the risk for people, property and environment in relation to dangerous goods.

- be appropriately structured to reflect the operator's systems

- be sufficiently detail to demonstrate to the operator's management that they meet their duties under the Act

- be effective in communicating the processes, hazards, controls and systems to the operator's workforce

- summarise the hazards, risks, consequences, control measures and the adequacy of those controls

- describe the processes used to systematically identify and evaluate the major incidents

- define the safety objectives

- set the direction and policies of the safety management system

- effectively describe the safety management system in place

- be implemented with all described controls and systems

- remain current and up to date at all times

- be commensurate to the size, complexity and risk of the facility.

2 Preparation of safety report documentation

A safety report is a legislative requirement to be approved by the Chief Officer and must be in force for all MHF operations before the storage, handling or processing of Schedule 1 substances in excess of the critical quantity, commences at the facility.

2.1 Planning and liaising with the Department

It is strongly recommended that operators meet with dangerous goods officers (DGOs) prior to the commencement of a new safety report or a five yearly update of a safety report. The process for reviewing and gaining understanding of safety report documents is extensive and cannot be completed quickly. By meeting with the Department, as early as possible and frequently, operators will be able to review and discuss the proposed operations to be conducted on the facility as well as the operator's approach to managing those operations.

Operators should develop a plan outlining the process and timeframe for completion and submission of the safety report including the risk assessment and safety management system together with any supporting documentation that may be required. This plan will provide a means of tracking progress of the development of the safety report. It will also give an indication of the length of time required to achieve that development and the members of the workforce that may be required to be involved in the development from time to time.

Progress against the plan, as well as any issues identified by the operator, can be discussed with the relevant DGO during liaison meetings.

The Department does not provide a consultancy service to review drafts of safety report documents or make recommendations for safety measures prior to formal submission for approval (Section 4.1).

Developing this interaction with the Department early in the process provides the basis of a good working relationship and an understanding of requirements between the operator and the Department.

2.2 Overview of the content of a safety report

Fundamentally, the safety report should demonstrate two key points.

It should firstly describe the systems used by the operator to determine:

- how hazards associated with dangerous goods (DG) are identified and risk assessed

- how this risk is reduced so far as reasonably practicable (SFARP).

Secondly, it should show the outcomes of applying those systems regarding:

- what hazards are on site that have the potential to result in a major incident

- what is the risk associated with those hazards

- SFARP demonstration to reduce the risk

- how the SMS ensures prevention of major incidents and achieves the continual improvement of the critical controls related to major incidents.

The safety report covers facilities and operations within the area that is defined as an MHF and the surrounding areas that may be impacted by a major incident at the facility (Section 3.1). The safety report is not required to cover the occupational safety and health requirements under the *Occupational Safety and Health Act 1984*.

The safety report should cover the following:

- Introduction – outlines the scope and purpose of the document, the legislation, principal standards and codes of practice covering the facility, approval and custodian details of the safety report, address for delivery of communications regarding the safety report and other administrative requirements (an example is provided in Section 3.1).

- Facility description – provides a concise overview of the facility, its configuration, locality and surrounding land use, function and control systems identified as a result of the risk assessment (an example is provided in Section 3.2).

- Risk assessment – provides a detailed description of the risk management methodology in place for the facility, a summary of the risk assessment workshops, details of identified major incidents, SFARP demonstrations and consequence analysis and frequency (an example is provided in Section 3.3).

- Safety management system (SMS) – provides a detailed description of the management systems in place to maintain the safety of the facility, the workforce and the surrounding environment. This includes performance standards for safety critical controls (SCCs) and supports the findings from the formal safety assessment (an example is provided in Section 3.4).

The safety report may be described as a detailed commitment from the operator to the Western Australia State Government that outlines the:

- location of the MHF and the functionality of plant and equipment installed

- types of safety studies undertaken

- results of those studies with regard to the identification of potential major incidents, the control measures in place and that the risk level is SFARP

- implementation of safety management controls of those studies.

The safety report should emphasise consultation, workforce participation and a continual improvement approach to safety and risk management. The reader should be assumed to be non-technical and independent.

It is the responsibility of the operator to specify what is required for safety and legislative compliance, including:

- clearly defining the operation

- identifying the process of how the operation will be conducted safely

- showing SFARP justification

- summarising the operation within the safety report.

Compliance to the safety report will be audited by the Department on a periodic basis. Audits by the operator, both internal and external, should also be performed and should cover all operations likely to take place, including those of contractors and subcontractors.

The operator is required to ensure the safety report is updated to include any significant changes for new or increased risks, equipment or operational changes or variation in the quantities of Schedule 1 substances stored at the facility. Such changes need to be managed in accordance with the operator's management of change processes and r. 30.

The safety report should also be updated to reflect non-significant changes. Changes assessed as being non-significant should be recorded in a suitable change log referenced in the safety report.

A five yearly review of the safety report must be undertaken by the operator and approved by the Chief Officer (Section 3.1.4).

In the event of an incident, the safety report may form part of evidence in legal proceedings.

2.3   Referencing within safety reports

There will be many requirements to reference the operator's procedures and other documentation summarised within the safety report.

As many operators now maintain all documentation in online databases, it is suggested that, where possible, these referenced documents are hyperlinked to provide ease of access.

All documents (e.g. procedures, technical studies) within a safety report need to be clearly referenced.

If an operator wishes to refer to another document from within the safety report, this subordinate document should be:

- explicitly identified in the safety report

- identified in some manner as being linked to the safety report

- available to the Department for review as part of the overall review and assessment of the safety report

- able to be used as the basis for audit to confirm that the document complies with legislation and that the organisation is conforming with the document

- maintained under document control to ensure that only the current version is available to personnel and previous versions have been archived

- a controlled document that is subject to the same change controls as the parent safety report and all changes are recorded and available for review

- subject to the same internal compliance quality assurance and quality control as the parent safety report to ensure that referenced documents meet legislative requirements and are being complied with.

The safety report should include a concise overview of the content of any referenced internal procedure or process document. A single sentence under the heading of a regulatory requirement that includes the referenced document is insufficient content for the safety report.

2.4   Workforce involvement

The operator should ensure that members of the workforce are involved in the development or revision of the safety report for the MHF [rr. 23(2)(e), 24(2)(b)] (Section 3.4.7).

Involvement of members of the workforce guide assists with this requirement.

2.5   Safety report – supporting documentation

The Chief Officer may require the submission of further information before making a decision on the approval of a safety report [r. 27].

Any further information provided will be formally considered to be included as part of the safety report submission. Typical examples of information requested are:

- any procedures or plans referred to within the safety report as containing pertinent information supporting that required by the Regulations, including document control, records management and emergency response plans (ERP)

- quantitative and qualitative risk assessments

- consequence analyses

- assessments that risks have been reduced to so far as reasonably practicable (SFARP)

- hazard and operability study (HAZOP)

- hazard identification study (HAZID)

- safety integrity level assessment (SIL)

- layer of protection analysis (LOPA)

- failure mode effects analysis (FMEA)

- fire and explosion risk analysis (FERA)

- occupied buildings risk assessment

- gap analysis with relevant codes and standards

- engineering studies and analyses

- external certification

- industry technical references.

2.6   Safety report – level of detail

The safety report is a roadmap to ongoing safety processes and risk management for the facility and should be seen as a standalone document. It must be auditable, that is, make statements that the operator can objectively prove have been achieved. While the safety report will reference other documents, all readers should be able to understand the operations of the facility, the associated risks and systems in place without referring to those documents.

Some common issues identified in safety report submissions include:

- inadequate identification of major incidents

- not clearly linking major incidents with the controls used to eliminate or minimise their occurrence

- inadequate demonstration of SFARP and of how risk targets have been met – especially cumulative risk

- vague statements rather than specific facts about the facility

- inclusion of assertions, independent of the risk assessment, about the overall acceptability of the design

- provision of too much operational detail so the currency of the document is difficult to maintain

- discrepancies in facts provided

- inconsistencies between written descriptions and figures or drawings

- lack of review or quality assurance processes

- illegible drawings or figures

- preparation in isolation without managerial, workforce input and technical input

- assumption that compliance to a standard is sufficient

- use of the risk assessment process to justify a plan or design

- safety reports written as though the Chief Officer is the intended audience rather than the workforce.

The safety report is a high-level document. Organisations should be careful not to incorporate irrelevant and minor details within the safety report. This is because the facility must comply with the safety report as the document forms the basis of safe operation for the facility. As such, it is advisable to refer to a particular procedure rather than incorporating the entire procedure in the report. This will allow the organisation the ability to change the internal procedure easily as long as it does not compromise the safety of the facility.

3   Example safety report that meets Chief Officer expectations

3.1   Introduction

The introduction covers the administrative requirements for the document and gives an overview of the structure of the safety report and the expectations of senior management.

The introduction should include details of the ownership and boundaries of the facility, including references to all the dangerous goods (DG) licences and registered DG pipelines as defined under r. 88 of the Dangerous Goods Safety (Storage and Handling of Non-Explosives) Regulations 2007 (DGSH) covered by the safety report.

3.1.1   Scope and objectives

Briefly outline the scope and objectives of the safety report including:

- boundaries of the facility

- references to all DG licences and registered pipelines

- details of legislation covering the operation of the facility

- demonstration that the operator has an integrated management system capable of systematically and continuously identifying, assessing and eliminating or minimising the hazards and risks to persons at or near the MHF

- commitment from management that the approved safety report, including the risk assessment, will be implemented and reviewed at regular intervals and updated as required.

Regulation 13 covers the requirement for an MHF to operate in accordance with a safety management system in an approved safety report.

3.1.2   Definitions and abbreviations

Definitions and abbreviations need to be included for any acronyms or terms used in the safety report, in either the introduction or the appendices. Operators should ensure that all significant definitions are included including such things as "serious harm" and "acceptance criteria". If definitions and abbreviations are in the appendices, then this should be noted in an area of the introduction.

For accuracy and consistency, the operator should use the definitions within the Act and the regulations in the safety report [s. 3 and r. 4].

3.1.3   Approval and custodian details

The safety report is to be prepared and submitted by the operator who must be a person who has control or management of the place (including control of contractors and sub-contractors).

Include the address for delivery of communications relating to the safety report.

3.1.4   Management of the safety report

The safety report is a dynamic instrument requiring monitoring and updating as and when the operator identifies the need to incorporate significant changes in the way safety is being managed on the facility, or as new or increased risks are identified.

The safety report should detail how it will be used and maintained as a controlled document.

It is important that the operator ensures that any proposed revisions have considered timelines as the revised safety report may require approval by the Chief Officer prior to any changes taking place on the facility.

This section should reflect the requirements of the revision of safety reports, including:

- The operator of an MHF must review and submit a revised safety report:

    - before the occurrence of any significant changes to the facility or systems [r. 30(1)(a)]

- as soon as practicable after a dangerous goods incident or major incident occurs at the facility [r. 30(1)(b)]

- as soon as practicable after becoming aware of a change in land use or zoning for the area surrounding the facility [r. 30(1)(c)]

- as soon as practicable after receiving information provided under a direction given under r. 31(1), namely that the Chief Officer considers that the proximity of two major hazard facilities to one another is such that an incident at one could cause a major incident at the other [r. 30(1)(d)]

- as soon as practicable after receiving a request by the Chief Officer [r. 30(1)(f)].

- The safety report is required to be updated and re-submitted five years after the last review under regulation r. 30(1)(e)(i); or if no interim reviews have been conducted, five years since the safety report for the facility was first approved under r. 27(1) [r. 30(1)(e)(ii)].

Further details on these requirements are included in Section 4 of this Guide.

3.2 Facility description

3.2.1 General

The facility description is an overarching explanation of the facility and its surrounding area within the safety report. It should aim to describe the operations being conducted and installations on site and be written in a way that provides a non-technical reader with a good understanding of the equipment, operation and safety critical systems, including their operational parameters.

Details should be included for the management of:

- normal operation – most operations functioning correctly with no or minor issues

- irregular operation – significant issues encountered during the operations on the facility

- shutdowns – how the operation of the facility is managed during shutdowns

- care and maintenance – the restricted operations on the facility during care and maintenance

- remote control – the areas of the facility where operations can be managed through remote control.

The content and level of detail should be sufficient to show how equipment will function within the facility and to gain an appreciation of the hazard potential of the systems to persons at or near the facility.

3.2.2 Notifiable information

Schedule 2 of the Regulations contains specific details of required notifiable information. It is not appropriate to include all of that information within the facility description section of the safety report; however, the operator should identify the need to include all of these requirements and note where they are located within the safety report. It is suggested that the use of a table listing the relevant clauses in Schedule 2 be used to demonstrate this, as shown in Table 1.

Table 1 Notifiable information

Dangerous Goods Safety (MHF) Regulations 2007	Requirement	Included in safety report
sch. 2,cl. 2(a)	Operator of the place is a corporation	
sch. 2, cl. 2(b)	Operator of the place is an individual	
sch. 2, cl. 2(c)	Location of the place	
sch. 2, cl. 2(d)	Land use and zoning for the area surrounding the place	
sch. 2, cl. 2(e)	Each kind of dangerous goods at the place	
sch. 2, cl. 2(f)	Nature of the business or other operation conducted at the place	

Dangerous Goods Safety (MHF) Regulations 2007	Requirement	Included in safety report
sch. 2, cl. 2(g)	Number of employees at the place	
sch. 2, cl. 2(h)	Plans showing the layout of the place and where dangerous goods are located	

3.2.3 Operator details

Include the details of the operator as required in Schedule 2, cl. 2(a) or cl. 2(b) relevant to a corporation or an individual operating the facility.

3.2.4 Operating experience and nature of business

Summarise the operating experience and nature of the business as required in Schedule 2, cl. 2(f) in relation to the operator.

This should be a concise overview of past experience and current operations.

3.2.5 Codes and standards

List the principal Australian, international and industry standards used for the design and operation of the MHF. This may be included in this section of the safety report or as appendices to the document. If the preferred structure is to use appendices, note this in the facility description.

3.2.6 Site information

Provide relevant information of the site including:

- location of the facility, include maps, aerial photos and other useful information
- zoning maps
- land use for the facility and the surrounding area, including separation distances to sensitive areas
- infrastructure supporting the area, including details of any critical infrastructure
- regional population density
- on site population density and the personnel distribution across the facility, including details of contractor population
- consultation processes in place both on site and off site
- topographical and meteorological information for the region
- related facilities (jetty, pipeline rail)
- interfaces with third parties, such as vessels, delivery trucks, port authorities, any other MHF sites in the vicinity
- temporary units on site

3.2.7 Site access and security

Provide details of the site access, preferably using route maps for clarity.

Describe the security provisions in place at the facility to prevent unauthorised access to the site or to critical or restricted areas of the plant [sch. 4, cl. 3].

Cross reference this section to the section in the SMS covering the procedures and plans in place to manage security (Section 3.4.25).

3.2.8   Dangerous goods and Schedule 1 substances

Include details of the dangerous goods and Schedule 1 substances at the site [sch. 2, cl. 2(e) and cl. 2(h)].

These details should include the name of each of the Schedule 1 substances held on site, the quantity, the means of storage, and a reference to the safety data sheet

3.2.9   Plant description

Provide an overview of the plant including:

* design philosophy and technology selection, include a summary of key design parameters cross-referencing key technical documents

* include a process overview of the facility, e.g. using diagrams to illustrate the process flow

* define the boundary point of interfaces with other facilities, vessels, trucks, trains or pipelines that are facilitating delivery of dangerous goods, power, water and utilities to the facility

* define the physical, electrical, isolation and instrumentation controls in place for the monitoring and management of the boundary point interfaces

* details of management of possible upstream and downstream impacts, e.g. sudden changes in pressure, the equipment in place to safely manage these changes

* utility systems available (fuel gas, instrument air system, utility water and potable water systems, nitrogen, diesel storage systems and power generation).

3.2.10   Plant layout

Detail plant layout at the site, including buildings and hazardous areas. The description should be supported by diagrams showing the plant layout, and include separation distances between buildings and storage areas and evacuation muster points.

Use the plant layout diagram to indicate the location of dangerous goods stored on site. Use of the dangerous goods site plan required by the DGSH sch. 3, cl. 9 may be made here.

Include an inventory of the dangerous goods stored on site and identify which of these equate to Schedule 1 substances under the legislation.

Cross-reference this information to the section of the SMS dealing with handling and storage (Section 3.4.15).

3.2.11   Design and engineering controls

Include details of the design and engineering controls that will enable ongoing safe operations.

This description should be specific to the facility and include details of any safety critical controls identified as part of the risk assessment. The facility description should include cross-references to the relevant major incidents and performance standards within the risk assessment and SMS sections of the safety report as appropriate.

Note: The following wording is an indication only and should not be considered as a standard inclusion in the safety report. Details included should be a concise overview and not include a full list of the individual controls in place.

Indication of content detail for control systems and structural integrity management
• Instrumentation and control systems – describe the instrumentation and control systems installed.
• Functional safety systems – describe any functional safety system in place for the facility.
• Leak detection systems – describe the leak detection systems in place.
• Fire and gas detection systems – describe the systems in place for the detection of a fire or gas leak within the facility.
• Emergency shutdown facilities – include a description of the emergency shutdown facilities installed.

Indication of content detail for control systems and structural integrity management
• Pressure relief and blowdown systems – describe what pressure relief and blowdown systems are present on the facility.
• Redundancy of safety systems – indicate what redundancies of safety systems are installed and how they would be brought on line as and when required, including backup power supply.
• Corrosion management – describe the corrosion management system in place, what processes are in place for monitoring corrosion.
• Scrubbing systems – describe the process in place in relation to eliminating toxins
• Bunding – describe the bunding system in place as secondary containment for leaks.

3.2.12 Emergency response

Provide details of the hardware in place for the management of emergencies. Include details for mustering, evacuation and escape from the facility, firefighting equipment installed and alarms that will be triggered in the event of an emergency. This should also include details of equipment available to manage toxic gas releases on site.

The details included in the facility description should be cross-referenced with the emergency response details included in the SMS (Section 3.4.24) and the risk assessment (Section 3.3).

3.3   Risk assessment

The safety report must summarise the various analyses and risk assessments undertaken in sufficient detail to provide evidence that the requirements in r. 23 have been addressed. This section of the safety report should therefore include a comprehensive summary of the assessments, analyses and results that have been documented as part of the facility risk assessment.

The risk assessment covers hazard identification, risk analysis, identification of major incident events (through likelihood analysis and consequence estimation), risk treatment and demonstration that the resulting risk is acceptable and reduced SFARP.

The risk assessment summary should demonstrate that:

- all hazards relative to dangerous goods impacting on people, property and the environment have been identified and assessed for their potential to cause a major incident

- all major incidents have been identified and documented

- the nature of harm and the consequences of each hazard that may cause a major incident has been appropriately assessed

- the operator has adopted and justified the use of applicable consequence thresholds and modelling methodologies that are established and widely recognised by the industry

- the likelihood of each hazard to cause a major incident has been appropriately assessed

- risk control measures, for prevention and/or mitigation of each hazard have been identified and documented

- the identified risk control measures for each of the hazards, have been assessed as eliminating or reducing SFARP the harm to people, property and the environment

- the criticality, effectiveness and reliability of the risk control measures have been assessed

- the operator has adopted a risk tolerability criteria reflecting societal expectations against which all individual and cumulative risks have been assessed and reduced to a level that is tolerable and SFARP

- details of the procedures and processes in place to achieve risk tolerability and reduced to SFARP should be included as a reference; this may be in the form of a cross-reference to the relative section of the safety management system.

The consequences of the risks considered should include the:

- impact on fitness for purpose of the facility
- safety and potential for serious harm
- impact on the surrounding community, property and the environment.

It is important that the subsidiary risk analyses are robust, transparent, clearly linked to this risk summary and associated major incidents.

3.3.1 Scope

Reference the facility operation covered by the risk assessment, the interaction with Schedule 1 substances and the types of risks covered in the assessment process, including loss of integrity on the facility, operation of the facility and work environment.

3.3.2 Methodology

Due to the complex and unique nature of many MHFs, often more than one type of process is required to demonstrate that all hazards are identified and risks are appropriately controlled.

Outline the risk assessment methodology, including the processes to:

- determine the acceptance criteria
- ensure appropriate participation and competence of personnel involved
- identify dangerous goods hazards
- identify major incidents
- select risk control measures
- analyse the consequence of each major incident
- analyse the probability and assess the risk of each major incident
- assess the adequacy/reliability/effectiveness of each risk control measure
- assess the cumulative risk of the facility
- enlist participation in the risk assessment process – outline the participants identified to attend risk assessments based on their level of experience, competence and involvement in the operations of the facility. This should include a broad range of workforce participation to ensure adequate levels of consultation and communication, which is an essential part of the risk management process.
- conduct risk analysis and evaluation – include details of the analysis and evaluation process undertaken, including reference to the risk matrix used, a copy of which should be included in the appendices to the safety report
- describe the process used to ensure the various assessments remain current and reflect current knowledge and operations. This may include a cross-reference to the section of the safety management system that describes the identification and management of hazards and risk assessments.

3.3.3 Supporting risk studies

The risk assessment should provide a summary of the supporting risk studies in sufficient detail to explain the risks, hazards, identified controls, interactions between the analyses, and demonstrate the methodology as implemented. The details of the supporting risk analysis should be referenced (including document number, date of study and title).

The supporting risk studies should cover:

- hazard identification
- consequence modelling based on hazards (e.g. overpressure, thermal radiation contours, and toxic plume dispersion)
- impact to occupied buildings and infrastructures (including beyond the boundaries of the facility if identifies)

- likelihood assessments – it is recommended that quantitative and/or semi-quantitative risk assessments be adopted to estimate the risk

- assessments of cumulative risk – the risk to individuals and work groups from both an individual event and cumulative perspective are aspects that need to be considered

- risk control measures

- demonstration of so far as reasonably practicable.

Hazard identification and *Risk assessment and management including operational risk assessment* guides can assist with this requirement.

3.3.4   Major incidents

The operator must identify all hazards relating to dangerous goods and assess them for:

- the probability of the hazard causing a major incident

- the nature of harm to people, property and the environment.

This section should list all identified major incidents for the facility and include details of:

- the causal factors

- the risk control measures that have been identified

- residual risk levels and that risk tolerability is achieved and reduced so far as reasonably practicable (SFARP).

Cross-references should be included to identify the areas of the safety report that cover those controls and the relevant performance standards developed for each safety critical control.

Major accident events, control methods and performance standards guide assists with this requirement.

3.3.5   Safety critical controls, performance standards and bowtie diagrams

The risk assessment description must summarise all of the risk control measures that the operator has identified to reduce the risk of a major incident to an appropriate level. Each of the key risk control measures is considered a safety critical control (SCC).

The method applied to demonstrate adequacy of the SCC should be included in the safety report and should cover the availability, reliability and independence of each SCC. This can be performed through benchmarking exercises, layers of protection analysis and/or functional safety assessments.

Operators should include a list of the performance standards that have been developed to validate that each SCC is monitored, tested and maintained to meet its defined functionality requirements.

The use of bowtie diagrams can assist in summarising the SCCs for major incidents by displaying each major incident with the associated preventive and mitigating controls in place.

Further details are included in *Major accident events, control measures and performance standards* guide*.*

3.3.6   Demonstration of so far as reasonably practicable (SFARP)

The risk assessment must demonstrate that the operator has reduced the risks associated with identified major incidents to meet the acceptance criteria and to a level that is SFARP. This should include a detailed description of the necessary prevention, detection, control and mitigation measures implemented.

Operators should include details of their definition of serious harm and risk acceptance criteria. Summaries of the risk assessment studies should also demonstrate that the various major incidents and cumulative risks meet the acceptance criteria and reduced SFARP.

This demonstration should include a technical argument as to why, having achieved the risk acceptance criteria, it is not reasonably practicable to implement further control and mitigation measures.

 ALARP demonstration guide assists with this requirement.

3.4 Safety management system (SMS)

Safety management in major hazard facilities is the systematic practice of identifying hazards relating to dangerous goods, assessing the risks and implementing risk control measures to minimise the risk.

The SMS description should define the system in sufficient detail to demonstrate the SMS satisfies r. 24 and Schedule 4 of the regulations.

The entire SMS does not need to be included in the safety report. However, it should provide sufficient information to demonstrate that the SMS adequately manages the risk control measures.

The SMS cannot be generic. It should be tailored to address the specific safety issues at the facility.

Some of the key characteristics required for the SMS include:

- a risk-based focus that reflects the process, hazards present and supports the operation of the facility
- it is fit-for-purpose and commensurate to the complexity of the operation – while it should not be over-complex, it must be sufficiently comprehensive to cover the full range of operations at the facility
- showing continuous improvement through learning and review
- human factors that contribute or affect the implementation of the safety management system are considered and addressed

The description should summarise:

- safety leadership
- the overarching policy and processes used to identify, assess and minimise risk
- the operator's management system in place
- any certification of the system
- review and improvement of control measures and corresponding parts of the SMS

Some useful sources of information for the development of an SMS in the process industry include:

- Centre for Chemical Process Safety, *Guidelines for risk based process safety*
- Energy Institute, *High level framework for process safety management*

3.4.1 Management commitment, leadership and safety policy

Effective leadership and visible management commitment are critical to the successful implementation and improvement of the SMS as well as the cultivation of the organisation's safety culture.

Include an overarching statement describing how these requirements will be achieved and include some examples of management participation and involvement in the setting and achievement of performance standards, objectives and targets for the safe operation of the facility.

3.4.2 Compliance

Include a statement to the effect that all personnel are required to comply with and enforce the provisions of the relevant legislation and the approved safety report and how this requirement is presented to personnel, i.e. through the induction process.

3.4.3 Management system overview

Provide details of:

- the operator's management system in place
- any certification of the system
- how the documentation is made available to all personnel as and when required.

3.4.4 Sources of information

Specify how the operator manages and maintains regulatory compliance for the safety report. This should cover an overview of the various areas monitored for changes in legislation, standards (both Australian and international) and importantly chemical information for the dangerous goods stored on site.

Any changes identified should be managed through the organisation's management of change process. (Section 3.4.18).

These requirements should be monitored by ongoing internal audits to ensure only current information is available.

3.4.5 Management structure and resources

The operator should define, document and communicate the management and organisational structure to the workforce and other key stakeholders.

This can be demonstrated by organisational charts showing position titles rather than actual names of personnel (this enables the current status of the safety report to be maintained in the event of staff movements between positions).

Include details of how the operator manages resources for the effective and safe operation of the facility, including the use of contractors and sub-contractors. Include details on staffing philosophy; e.g. FIFO, residential, location of engineering support, control room personnel. This may include reference to annual work program reviews and budgets. List referenced internal documents to support this requirement.

3.4.6 Accountabilities and responsibilities

Include details of the safety critical roles and outline which positions are accountable and responsible for the operation of the facility under normal day-to-day operations and in the event of an emergency.

The chain of responsibility for emergency events may be included here or under the section of the safety report covering emergency response and the emergency response plans in place (Section 3.4.24).

3.4.7 Workforce consultation and communication

Outline how the operator maintains effective workforce involvement, participation and consultation mechanisms for safety, the control of workplace hazards and risks, and in the development of the safety report [rr. 23(2)(e), 24(2)(b)].

Detail the methods of consultation and communication in place to inform employees of the hazards, risks and controls. This could include pre-start and toolbox meetings, minutes and noticeboards. Also, include the processes to inform other persons present at the plant of their requirements and expectations.

Any relevant internal documents covering these activities should be listed as referenced documents under this section [sch. 4, cl. 4(1)(2)].

Refer to *Involvement of members of the workforce* guide for further details.

3.4.8 External communication

Identification and communication with the community and other stakeholders located in the areas adjacent to the facility is a key process required to be put in place by the operator.

Describe the processes and procedures in place that define the type and level of interaction with external parties, such as regulatory bodies, industry associations, community groups, local government departments, emergency services and the general public. Examples of information to be provided are:

- the use of dangerous goods at the facility
- the potential consequences of an incident
- the exercises and testing of alarms to be undertaken at the facility
- the actions members of the community should take if a dangerous situation or major incident occurs.

Provide detail of how the operator will record these interactions and how they are retained within the records management system [sch. 4, cl. 4(3)(4)].

3.4.9 Hazard identification and risk management

Demonstrate the key methods of hazard identification and risk management for the facility. The process should be robust and fully detail the characteristics of the risk management system in place including the general requirements for the organisation to implement and maintain procedures to:

- identify all hazards related to dangerous goods

- assess the risks

- implement the control measures

- establish periodic evaluation of the effectiveness of the controls.

Following the hazard identification, an assessment of the risk is completed. The safety report should include details of the risk methodology used and reference the operator's relevant internal documents [r. 23].

Clearly indicate how the risk control measures are assessed for adequacy, effectiveness of control implementation and periodic review. The industry practice for this process includes identification of safety critical controls, equipment and processes, and discusses their management.

It is expected that there will be numerous internal operator documents that will relate to the hazard identification and risk assessment requirements. The document number and title should be listed, with the option to hyperlink, as reference documents under the relevant section.

Hazard identification and risk management methodologies are not specified in this Guide, but can be found in *Hazard identification* and *Risk assessment and management including operational risk assessment* guides and the *Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007 – guide.*

A summary of those requirements relevant to the facility should be included in this area of the safety report.

3.4.10 Performance standards for safety critical controls

Describe the process and methodology for the identification, development and management of performance standards for each of the safety critical controls that have been listed as controls for the major incidents identified in the risk assessment.

The performance standards should be cross-referenced to the relevant potential major incident, and the relevant sections of the facility description and risk assessment that relate to this requirement.

Reference should be made to:

- the relevant procedure covering the development of the performance standards

- who is responsible for the development and approval of the performance standards

- the system used to implement the performance standards and its accessibility

- the assurance system in place for monitoring the compliance with the performance standards

- the system in place and frequency for the review and verification that the identified requirements under these standards are still viable

- the tools used for monitoring the effectiveness of the critical controls as well as compliance to the safety management system. [r. 5].

Major accident events, control measures and performance standards guide assists with this requirement.

3.4.11 Safety objectives, targets and plans

Reference the procedures and processes in place for the setting, completion and review of the risk improvement objectives that need to be set for the facility. In this context, an objective is an overall long-term goal and a target is a specific improvement step set as a means of achieving the objectives.

3.4.12 Records management and document control

Describe the records management and document control of all records and documents developed in the course of designing, constructing and operating the facility.

The main difference between controlled documents and a record is that while SMS documents are periodically reviewed and revised, a record constitutes the evidence of the completion of an activity and, as such, is not revised or altered.

Include details of where documents are located and that they are readily available to personnel as and when required.

Records management including document control guide can assist in this area.

3.4.13 Facility design

Include facility design management with a brief outline of design development, resources and responsibility. It should cover the systems and processes used to ensure the ongoing adequacy of the design and construction, and also consider items such as design life management, life extension, periodic design review, verification or validation, positive material identification, material certification, proof testing, non-destructive testing and as built drawings.

Operators should also consider and document a process for the decommissioning of all or part of a facility, including, for example, the development of a decommissioning plan and supporting procedures for interfacing with the ongoing operations of some parts of the facility during the decommissioning.

Detail the procedures used to consider human factors in the design process, such as human error minimisation, human-machine interface, and ergonomics assessments etc.

3.4.14 Safe operating procedures

Schedule 4, cl. 2 of the regulations lists certain procedures that must be included in the safety report for the safe operation of plant.

The SMS must include a section on safe operating procedures for the facility. Operators need to ensure that the operating procedures required to support operations are identified, available, accurate, up to date, understood and used.

The overview of the operating procedure should include the purpose of the procedure and summarise the key responsibilities, competency requirements and the process, and explain how the documentation is made available to all personnel as and when required.

Safe operating procedures that should be considered in the SMS are:

- commissioning and start-up
- process control and monitoring
- handover
- permit to work
- pre-work checks
- plant isolation/tagging/lock-out system
- bridging or bypass and suppression
- placarding and hazard identification
- transfer - loading and unloading
- alarm management
- control and access to hazardous areas
- a general overview of documentation of work practices for routine, semi-routine and non-routine work instructions and operations procedures
- interaction between operations and construction activities
- shutdown or decommissioning.

Internal documents should be referenced to limit the inclusion of excess detail for each of these activities, with document title and ID number listed.

3.4.15 Dangerous goods safe storage and handling

The requirements for the safe storage and handling of dangerous goods are covered in detail in the *Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations – guide*.

Operators should consider referencing this document to ensure they have all the appropriate procedures in place for the management of this safety critical area including the development and review of safety data sheets and safety information required by the production of dangerous goods.

A summary of the arrangements to ensure that operational interfaces with third parties are identified, assessed and appropriately managed should also be considered. The dangerous goods risk assessment for non-Schedule 1 substances should be referenced in the safety report.

3.4.16 Training and competency

A process must be in place to ensure personnel allocated responsibilities under the SMS are competent to fulfil these duties [sch. 4, cl. 1]. This includes the selection process and training.

A comprehensive training process must be in place for all employees to ensure an acceptable level of competence. These training requirements should be aligned to the responsibilities outlined in individual position descriptions. The process should also include identification of specific training needs for specialist positions, such as hazardous area management and corrosion management.

The training process should include:

- a needs assessment – provide a comprehensive list of the training required for each position within the organisation to enable each employee to perform their duties effectively and in compliance with all the SMS requirements
- how training records are maintained
- assessment of employee competency for the tasks they are to perform
- re-assessment requirements at periodic intervals
- how the training process will be audited to provide assurance and ongoing improvement.

A reference list of the operator's internal procedures and processes for employee selection, training and competency, training record systems, internal auditing and succession planning should be included.

3.4.17 Contractor management

Contractors can introduce unsafe conditions, processes, practices, standards and materials and need to be subject to safety controls to ensure their practices do not jeopardise facility safety.

The operator of a facility has ultimate responsibility for the safe operation of the site and should have an effective system in place for selection and management of contractors at a site. Relevant procedures and processes that manage contractors should be referenced in this section.

3.4.18 Management of change and project management

A formal system for the management of change at a facility is required to ensure that changes are not introduced which could inadvertently compromise the safety of the facility and impact on employees, the community and the environment.

Project management procedures need to be fully documented, well understood and readily available to personnel and contractors. Key stages in the project development lifecycle require review and approval by specified levels of the operator's management.

Management of change should be applied to:

- any change to the safety report
- any change that causes a change in the safety report
- any change to procedures, processes or standards
- modifications to safety critical controls or performance standards
- organisational change
- capital projects

- modifications of existing facilities (structure, instrumentation, chemicals etc.)

- changes to operating conditions outside the standard working parameters (alarms, bypasses, derating etc.)

The operator should have in place formal written procedures for management of change and project management, which include a clear description of the type of changes that will cause the procedures to be implemented.

Management of change guide will assist with this requirement.

3.4.19 Procurement and control of materials and services

Describe the written procedures and processes for procurement of all goods and services for the operation of the facility, including equipment, devices, hardware and software.

The procedures should require that suppliers provide all relevant safety information, including the provision of SDS. The system should also ensure that suppliers are aware of the relationship between their products or services and the hazards associated with the processes of the facility.

The purchase procedure for all supplies and services critical to the nature of the facility's business should ensure that purchase documents contain, where applicable:

- precise identification of the product or service to be delivered

- product acceptance criteria

- specific references to drawings, specifications and standards which should be used as part of the contract.

Procedures should include:

- checking compliance of delivered products and services against the procurement specifications

- documentation, segregation and disposal of non-conforming products

- provision of safe storage and handling facilities for all hazardous materials and equipment (Section 3.4.15)

- an inspection system for all materials and equipment stored, to ensure that these are not issued in a deteriorated or unserviceable condition (Section 3.4.20).

Relevant procedures and processes that manage procurement should be referenced in this section to avoid inclusion of too much detail.

3.4.20 Plant integrity management

The operator of the facility should have a system in place to monitor and maintain the integrity of the process, infrastructure and all plant and equipment, where failure could contribute to a loss of control, major incident or near miss. An equipment integrity program should focus on the maintenance of existing plant and equipment, as well as ensuring that newly installed equipment meets the design criteria and standards [sch. 4, cl. 2(1)(b)].

Describe the integrity management plan in place. The integrity management plan should be linked with the maintenance management system to provide an ongoing review of the management and monitoring of the integrity of the facility operations.

This section should detail the periodic review of the integrity management plan, actions to be taken as a result of the various survey studies that may have been conducted on the facility and other activities that consider the condition of the facility from time to time.

Review and highlight areas of the facility where machinery and equipment may be ageing and require additional management, including increased testing and inspection and forecasting of possible parts replacement or major overhauls.

Reference should be included to the integrity management plan document including the title and document number.

3.4.21 Maintenance and repair

Describe the operator's maintenance strategy and the maintenance management system that is in place to ensure the integrity and reliability of the facility operation [sch. 4, cl. 2(1)(b)]. The system should include a list of all plant and equipment located at the facility and the scheduled maintenance requirements applicable under the work program.

The maintenance management system should be supported by various work procedures and work instructions. This section should explain the maintenance and repair philosophy, in particular the equipment considered safety critical. Operators must ensure that personnel familiar with the requirements of the machinery and equipment are involved in the development and review of these work program documents [rr. 23(2)(e), 24(2)(b)].

For ageing plant, include details in the safety report of how this is being managed detailing studies completed to maintain this plant.

3.4.22 Inspection, testing and monitoring

General inspection, testing and monitoring should be covered, providing an overview of scheduled and unscheduled requirements.

The management of identified safety critical controls (as identified in the facility risk assessment) should be covered in this section, with details as to how those controls are managed through the maintenance management system to ensure they are regularly inspected, tested against appropriate standards and tested to monitor their application in the event of an emergency.

Describe the process in place to determine the frequency of the inspection, testing and monitoring. This process should include periodic reviews to ensure that the inspection schedule is still viable taking into account the age of the equipment and machinery being checked and whether or not the schedule should be adjusted to either increase or reduce the inspection frequency based on the age, status and condition of the equipment and machinery.

This section should reference the maintenance management system in place as well as planning and scheduling documentation and facility work programs.

3.4.23 Incident and hazard management

Outline the operator's system for the management of incident and hazard reporting and investigation, and summarise the system with reference to the internal procedures and processes used.

Details should be included for the process of management and tracking of incidents or near miss occurrences which are considered to be reportable incidents under the Act [s. 9], or that may trigger a review of the safety report after a major incident or dangerous goods incident [r. 30(1)(b)].

Reportable incidents should be notified to the Department initially by email or phone call

Following the initial report, a dangerous goods incident report form must be completed and lodged with the Department within 21 days of the incident occurring. This report details root and contributory causes and actions to be taken to prevent or minimise incident recurrence.

The Dangerous goods incident report form and further information is located on the Department website.

All personnel, including supervisors, safety representatives and managers involved in incident and hazard investigation and reporting, should be trained and competent in this area.

The overview of the system should also include reference to communication of the investigation results to the workforce and the corrective actions generated to prevent a recurrence of the incident. The *Reporting dangerous goods incidents – guideline* assists with this requirement.

3.4.24 Emergency response

The SMS must include a description of the emergency response plan (ERP) and how it will be implemented. The ERP must be site specific and fit for purpose, and should be linked into the organisation's overall crisis management plan [DGSH rr.75, 118, 119 and sch. 4, cl. 2(2)].

The operator should demonstrate within this section that:

- emergency response roles and responsibilities have been documented within the ERP and there is a description of the chain of command for emergencies

- emergencies are resourced through internal and external resources, if applicable

- the ERP contains details of emergency scenarios that may occur on the facility

- procedures are in place for the management of emergencies and the controlled shutdown and isolation of the plant, or part of the plant

- emergency response training is conducted for all personnel

- emergency response drills and exercises are scheduled, conducted and reports generated on the results

- a Department of Fire and Emergency Services emergency response guide is in place

- consultation and communication has taken place with:

  - any neighbouring hazardous facilities

  - local police, fire and other emergency services and local government departments

  - managers of any sensitive environmental sites

  - facilities accommodating large numbers of people (e.g. commercial or shopping centres, motels, recreational facilities)

  - facilities provided for members of the community who may be more vulnerable to the consequences of an emergency (e.g. schools, childcare centres, hospitals and nursing homes).

The operator should list all internal referenced documents where critical information is contained rather than include large sections of the ERP to cover these requirements.

This section of the SMS should be cross-referenced with the facility description and must demonstrate that the major incident emergencies covered in the risk assessment are included in the emergency response plans.

Emergency planning guide assists with this requirement.

3.4.25 Site security and access control

Operators should ensure that systems are in place to monitor and control security and access to the facility [sch. 4, cl. 3].

Site security control philosophy should be described and referenced. It will need to cover the prevention of unauthorised acts that could cause a major incident and for preventing acts intended to cause a major incident. Consideration needs to be given to the prevention of access to the public or unauthorised personnel as well as intentional sabotage.

Depending on the nature of business, the philosophy for cyber-security may be included in the safety report.

A security plan should be developed for the facility including the control of data and communication systems. The security plan should be integrated with other areas of the management system, such as induction requirements and the emergency response plan. The security plan should summarise roles and responsibilities, access control systems and management of visitors and contractors on the site.

3.4.26 Safety management system audits

This is a key element of the SMS and operators must have an audit system in place that is clear, objective and evidence-based to show outsiders that the operator conforms to the SMS [sch. 4, cl. 5(2)(3)].

The Chief Officer may direct the operator to engage an approved auditor to conduct an audit and to report their findings to the Chief Officer [s. 46].

This section should detail the audit process, including the existence of an audit plan outlining the methodology by which the operator will conduct internal or external audits. The audit plan should include details of auditor independence requirements for the areas being audited and the qualifications of the auditor.

Specific attention should be paid to the auditing of systems and measures that prevent or mitigate major incidents. This would include:

- hazard identification and risk assessment processes

- safety critical procedures

- the effectiveness of safety critical controls

- compliance with performance standards.

Detail the management of non-compliance areas identified during the audit, how actions are generated to address the non-compliance and the monitoring of the actions through to effective closure.

Audits, review and continual improvement guide will assist with this requirement.

3.4.27 Human factors

The prevention of major incidents depends to a large degree upon human reliability irrespective of the level of automation for a facility. Studies have shown that up to 90 per cent of accidents are attributed to some degree of human failure.

Describe how the human failure leading to major incidents are managed as well as how the human factor is embedded in the safety management system, especially in risk assessment, incident investigation, etc.

The level of focus on human reliability depends on a number of factors including the level of risk, incident history, dependency on human reliability, complexity of the operation etc. For simpler sites, it is only necessary to incorporate human factors during the risk assessment. Complex sites, however, may require a comprehensive human factor related study and robust human factor management system.

3.4.28 Review and continual improvement

The operator is required to have procedures in place to ensure the effectiveness of the risk control measures are monitored and are compliant with the safety management system [sch. 4 cl. 5(2)-(4)].

This section should include a summary of the process used to monitor developments in safety, including awareness of incidents in the industry, learnings from other incidents, and changes in standards and legislation. Errors, deviations and breakdowns in control measures and corresponding parts of the SMS need to be tracked to provide data and reflect the actual safety performance of the facility and overall improvement.

The results of the review should be documented and be formally communicated to management for review and identification of actions. These actions should provide continual improvement to the SMS through identification of new objectives and targets, ongoing audits and the closeout of actions generated from audit reports, incident investigations and generated actions.

The areas of audit, review and continual improvement are significant areas of the safety report and should focus on:

- verifying that the safety report is appropriate and fit for purpose

- validating that the operator is complying with the safety report

- assessing effectiveness of risk control measures

- identifying and managing continual improvement.

It is expected that these processes be robust, comprehensive and continuous. It is important that details contained within the safety report are comprehensive and concise.

The operator should ensure that they have a regular process in place to verify that their audit, review and continual improvement requirements are managed effectively. Where the Department's inspection findings identify issues with the systems, questions may be raised as to why these issues were not identified and corrected through the operator's audits, review and continual improvement requirements.

The major hazard facility guide, Audits, review and continual improvement assists with these requirements.

4 Submission and assessment of the safety report

A formal letter from the operator addressed to the Chief Officer must accompany all submissions for the assessment and approval of a safety report. This letter should set out as a minimum:

- the full title of the document, date and version number being submitted to the Department

- the reason the safety report has been revised, e.g. first issue of the safety report, revised due to significant change on the MHF or 5 yearly review of the safety report

- details of which regulation and any sub-regulation under which the safety report is being submitted.

A letter template covering the details of the safety report revisions is available for operators to use from the DMIRS website.

The submission of the updated safety report and accompanying formal letter from the operator should be emailed to the DGO acting as case manager for the facility.

The operator of a facility must take reasonable measures to ensure that all information contained in the safety report is accurate. During the assessment, the content of a safety report is presumed to be accurate unless there is clear evidence to the contrary.

4.1 Application for approval of a safety report

Once the safety report for a facility has been developed and approved by the operator, an application for the approval of the safety report must be made to the Chief Officer in an approved form [r. 26(a)].

The purpose of this document is to provide guidance as to the form of a safety report which is acceptable to the Chief Officer (refer to r. 25(2)(d)).

When submitting the safety report for approval by the Chief Officer for the first time, the application must be accompanied by the relevant fee [sch. 3, cl. 1].

4.2 Consultation on the submitted safety report

The Chief Officer is required to consult with the operator on the submitted safety report before deciding to refuse, approve or withdraw an approval of a safety report.

If the Chief Officer is not satisfied that the submitted safety report meets the requirements of the Regulations, the operator of the facility must be given notification in writing of the proposed decision and the reasons for that decision [r. 29(1)].

The written notification to the operator must also include an invitation to the operator to review the safety report and resubmit the amended report to the Chief Officer before a date specified in the notice [r. 29(1)(b)].

If the Chief Officer still decides to refuse approval or withdraw approval of the safety report as amended and resubmitted by the operator, notice of that decision must be given to the operator in writing, and include the reason for the decision, and information regarding the operator's right to have the decision reviewed [s. 67].

4.3   Revision of safety reports

An operator of a facility must review and update the safety report, including the risk assessment and safety management system within the safety report [r. 30 (1)]:

- before implementing a significant change to:
  - any plant, process or substance used at the facility, including the introduction of any new plant, process or substance
  - the layout of the facility or where dangerous goods are to be stored, handled or transported within the facility
- as soon as practicable after a dangerous goods incident or major incident occurs at the facility
- as soon as practicable after becoming aware of a change in land use or zoning for the area surrounding the facility
- as soon as practicable after receiving information provided under a direction given under r. 31(1)
- as soon as practicable after a request by the Chief Officer
- on the operator's own initiative to review the safety report, risk assessment or safety management system for the facility.

If the review indicates that one or more of either the safety report, the risk assessment or the safety management system no longer complies with the regulations, then the operator must immediately amend the safety report, the risk assessment or the safety management system so that it does comply with the relevant regulation [rr. 23(2), 24 (2), 25(2)].

If a review indicates changes are required to the safety report, it is recommended that the operator contacts the Department as early as practicable as outlined in Section 2.1 of this Guide.

Once the safety report has been updated, the revised document should be submitted to the Chief Officer for approval [r. 26].

If review of the safety report in connection with any of the above requirements does not indicate that the safety report, the risk assessment or the safety management system requires amendment, then the operator of the facility must give the Chief Officer written notice that they have reviewed the safety report and no amendment is required [r. 30(4)].

4.4   Revision after five years

The operator is required to conduct a review of the safety report for the facility as soon as practicable after the expiry of:

- five years since the last review under r. 30
- five years since the safety report for the facility was first approved under r. 27(1) if a review has not been conducted.

The five yearly review of the safety report should include:

- detailed review and update, where required, of the risk assessment, taking into account the effects of any major incidents that have occurred during the period
- review and update of the facility description to reflect any significant changes to the plant or facilities during the previous five years of operation
- review and update of the SMS for changes in procedures, processes or standards.

Once the safety report has been updated, the revised document should be submitted to the Chief Officer for approval [r. 26].

If review of the safety report in connection with any of the above requirements does not indicate that the safety report, the risk assessment or the SMS require amendment, then the operator of the facility must give the Chief Officer written notice that they have reviewed the safety report for the facility and no amendment is required [r. 30(4)].

4.5   Notice of approval or withdrawal of a safety report

The Chief Officer may approve the safety report for a facility if they are satisfied that it complies with the regulations [r. 27(1)].

Approval of a safety report may be withdrawn by the Chief Officer if it is considered that the safety report no longer satisfies the requirements of the regulations [r. 28(1)].

However, the Chief Officer cannot withdraw approval of a safety report if:

- the operator of the facility to which the safety report relates has amended the safety report under r. 30(3)(d) and applied for approval of the amended safety report under r. 26(1) [r. 30(3)(e)]

- the Chief Officer has not given the operator notice under r. 29(2) that the Chief Officer refuses to approve the amended safety report [r. 28(2)(b)].

All decisions connected with the approval or withdrawal of a safety report must be given in writing by the Chief Officer and include reasons for the decision [r. 29].

4.6   Refusal to approve or withdrawal of approval of the safety report

Before the Chief Officer refuses to approve or withdraws approval of a safety report, the operator of the MHF to which the safety report relates must [r. 29(1)(2)]:

- be given written notice of the Chief Officer's decision to either refuse approval or withdraw approval of the safety report and the reasons for the intended decision

- be invited to make a submission to the Chief Officer in relation to the intended decision

- have any submissions made to the Chief Officer considered.

If, following consideration of any submissions made by the operator, the decision of the Chief Officer is to refuse approval or withdraw approval of the safety report, then notice of that decision must:

- be made to the operator in writing

- include the reasons for the decision

- advise the operator that they have the right to have the decision reviewed under s. 67 of the Act.

Appendix 1   Legislative provisions

The sections of the *Dangerous Goods Safety Act 2004* and parts of the Dangerous Goods Safety (Major Hazard Facility) Regulations 2007 that are applicable to this Guide are listed below.

Dangerous Goods Safety Act 2004

Part 1 – Preliminary

s. 3   Terms used and abbreviations

Part 2 – General duties as to dangerous goods

s. 8   Duty to minimise risk from dangerous goods

s. 9   Duty to report certain situations

Division 4 – Audits of dangerous goods sites

s. 46   Audit may be directed by Chief Officer

Part 7 – Legal Proceedings

s. 67   Review of decisions under this Act

Dangerous Goods Safety (Major Hazard Facility) Regulations 2007

Part 1 – Preliminary

r. 4   Terms used

Part 2 – Main offences

r. 13   Major hazard facility to operate in accordance with safety management system in approved safety report

Part 5 – Safety reports

r. 23   Risk assessment, operator of major hazard facility to prepare

r. 24   Safety management system, operator of major hazard facility to prepare

r. 25   Safety report, operator of major hazard facility to prepare

r. 26   Safety report, application for approval of

r. 27   Safety report, approval of by Chief Officer

r. 28   Withdrawal of approval of safety report

r. 29   Chief Officer to consult etc. before refusing to approve or withdrawing approval of safety report

r. 30   Safety report, review of by operator of major hazard facility

Part 6 – Miscellaneous

r. 31   Major hazard facilities near to one another, Chief Officer may direct one to give information to the other

Schedule 1 – Threshold quantity for Schedule 1 substances

cl. 1   Threshold quantity for substances

cl. 2   Threshold quantity for categories of substances

Schedule 2 – Notifiable information

cl. 1   Term used: material safety data sheet

cl. 2   Notifiable information

Schedule 4 – Procedures to be included in safety management system

cl. 1   Skills etc. of employees, procedures to ensure

cl. 2   Operation etc. of plant, etc. procedures for

cl. 3   Security, procedures to ensure

cl. 4   Safety information, procedures to ensure employees are given

cl. 5   Risk control measures, procedures to ensure monitoring of, etc.

Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007

r. 88   Some pipelines to be registered

Schedule 3 – Dangerous goods site plan

cl. 9   General information in plan

Appendix 2 Glossary of terms

The following terms are defined for the purposes of this guide.

Community. All people living or working outside the facility who would be likely to suffer personal injury or property damage if a major incident occurred at the facility.

DG. Dangerous goods.

DGO. Dangerous goods officer.

EERA. Evacuation escape and rescue analysis.

ERP. Emergency response plan.

Facility. A major hazard facility as classified by the Chief Officer.

HAZID. Hazard identification study.

HAZOP. Hazard and operability study.

KPI. Key performance indicators.

LOC. Loss of containment.

LOPA. Layers of protection analysis.

Major incident. An incident involving or affecting a Schedule 1 substance (Dangerous Goods Safety (Major Hazard Facilities) Regulations 2007) as defined in r. 4 of the Regulations that causes serious harm to people, property or the environment.

Operator. A company or individual engaged in the operation of a major hazard facility who has the control and management of the place.

Performance standard. A standard established by the operator defining the performance required for a safety critical control typically defining the functionality, availability, reliability, survivability and interdependency of the safety critical element.

PPI. Positive performance indicators.

PTWP. Permit to work procedure.

QRA. Quantitative risk assessment.

Safety critical control. Any item of equipment, system, process, procedure or other control measure the failure of which can contribute to a major incident.

SCC. Safety critical control.

Schedule 1 substance. A substance listed in Schedule 1 Table 1, or a substance belonging to a category of substances listed in Schedule 1 Table 2 of the Regulations.

SDS. Safety data sheet.

SFARP. So far as reasonably practicable.

Serious harm. Significant incident associated with substances in Schedule 1 of the regulations.

Appendix 3 Safety report content map

Content map

Guide section	Regulation	Topic	Section(s) of safety report / comment why not required
Introduction and scope			
3.1.1		Scope and objectives	
3.1.3	r. 13 r. 25	Approval and custodian	
3.1.4	r. 12 r. 30(1)	Management of the SR	
Facility description and notifiable information			
3.2.3	Sch. 2 cl. 2(a) Sch. 2 cl. 2(b)	Operator details	
3.2.6	Sch. 2 cl. 2(c) Sch. 2 cl. 2(d) Sch. 2 cl. 2(g)	Site information	
3.2.8	Sch. 2 cl. 2(e)	Dangerous goods and Schedule 1 substances	
3.2.4	Sch. 2 cl. 2(f)	Nature of the business	
3.2.10	Sch. 2 cl. 2(h)	Plant layout	
3.2.1		General facility description	
3.2.5		Codes and standards	
3.2.7		Site access and security	
3.2.9		Plant description Plant and process overview	
3.2.11		Design and engineering controls	
3.2.12		Emergency response hardware	
Risk assessment			
3.3.2 3.3.3 3.3.4	r. 23(2)(a)	Identified all dangerous goods hazards	
		Documented all major incidents	
	r. 23(2)(b)(i)	Probability of hazard causing an MI determined	
	r. 23(2)(b)(ii)	Assessed consequences of each hazard	
3.3.2 3.3.5	r. 23(2)(c)	Risk control measures identified	
3.3.2	r. 23(2)(d)	Risk acceptance criteria defined	
		Risk assessment process justified	
3.3.3		Subsidiary risk analyses referenced	
3.3.6		SFARP demonstration	

Guide section	Regulation	Topic	Section(s) of safety report / comment why not required
Safety management system			
3.4.1	r. 13	Management commitment and policy	
3.4.2	r. 13	Compliance	
3.4.3	r. 24(2)(a)	Management system overview	
3.4.5		Organisational Structure	
3.4.6		Accountabilities and responsibilities	
3.4.11		Safety objectives and targets	
3.4.16	Sch. 4 cl.1	Training and competency	
3.4.14	Sch. 4 cl. 2(1)(a)	Safe operating procedures	
3.4.9	Sch.4 cl. 2(1)(a)	Hazard identification and risk management	
3.4.10	Sch.4 cl. 2(1)(a)	Performance standards	
3.4.12	Sch. 4 cl. 2(1)(a)	Records management and document control	
3.4.13	Sch. 4 cl. 2(1)(a)	Facility design	
3.4.18	Sch. 4 cl. 2(1)(a)	Management of change	
3.4.19	Sch. 4 cl. 2(1)(a)	Procurement and control of materials	
3.4.20,	Sch. 4, cl. 2(1)(b)	Plant integrity management	
33.4.21	Sch. 4, cl. 2(1)(b)	Maintenance and repair	
3.4.22	Sch. 4, cl. 2(1)(b)	Inspection, testing and monitoring	
3.4.14	Sch. 4, cl. 2(1)(c)	Safe operating procedures	
3.4.14	Sch. 4 cl. 2(3)	Safe operating procedures	
3.4.25	Sch. 4 cl. 3	Site security and access	
3.4.15	DGSH	DG storage and handling processes	
3.4.7	r. 24(2)(b) Sch. 4 cl. 4(1) DGSH r. 83	Workforce consultation	
3.4.17	Sch. 4 cl. 4(2)	Contractors and visitors	
3.4.8	Sch. 4 cl. 4(3)	External communication	
3.4.26	Sch. 4 cl.5 (2) Sch. 4 cl.5 (3)	SMS audits	
3.4.27	Sch. 4 cl.5 (4)	Review and continual improvement	
3.4.23	DGSH r. 120(a)	Incident and hazard management	

Guide section	Regulation	Topic	Section(s) of safety report / comment why not required
3.4.24	DGSH rr. 8, 75, 118, 119 MHF Sch. 4 cl. 2(2) Sch. 4 cl. 4(3)(c)	Emergency response	

Appendix 4 Further information

Other guidance available:

- *ALARP demonstration*
- *Audits, review and continual improvement for major hazard facilities*
- *Bridging documents and simultaneous operations (SIMOPS)*
- *Dangerous goods safety (storage and handling of non-explosives) regulations 2007 – guide*
- *Emergency planning*
- *Hazard identification*
- *Involvement of members of the workforce*
- *Major accident events, control measures and performance standards*
- *Management of change*
- *Providing information to the community*
- *Records management including document control*
- *Reporting dangerous goods incidents – guideline*
- *Risk assessment and management including operational risk assessment*